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FOR THE

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<p>REPORT OF THE COMMISSIONER OF INDIAN AFFAIRS: A patent for land; penal settlements; sale of arms to Indians; In- dian education; Indian freighting; stock cattle; granaries and root houses; Indian police; marriages; Poncas; Chief Mosce and his people; remnant of Dull Knife's band; Little Chief's band of Cheyennes; outbreak of the Utes; Ute commission of 1878; Victoria and the Southern Apaches; Joseph's band of Nez Percés; Mission Indians; sanitary; consolidation of agencies; Yakama and Malheur agencies; reservation titles; invasion of the Indian Territory; intru- sion on Indian lands; law for Indian reservations; depreda- tions on Indian timber; Board of Indian Commissioners; appraisement of Kansas Indian lands in Kansas. <i>Reports</i> <i>of Indian Agents:</i> Colorado River Agency, Arizona; Pima Agency, Arizona; San Carlos Agency, Arizona; Hoopa Agency, California; Round Valley Agency, California; Tule River Agency, California; Mission Agency, San Ber- nardino, California; Los Pinos Agency, Colorado; Southern Ute Agency, Colorado; White River Agency, Colorado; Cheyenne River Agency, Dakota; Crow Creek Agency, Dakota; Devil's Lake Agency, Dakota; Fort Berthold Agency, Dakota; Lower Brulé Agency, Dakota; Pine Ridge Agency, Dakota; Rose Bud Agency, Dakota; Sisseton Agency, Dakota; Standing Rock Agency, Dakota; Yankton Agency, Dakota; Fort Hall Agency, Idaho; Lemhi Agency, Idaho; Lapwai Agency, Idaho; Cheyenne and Arapaho Agency, Indian Territory; Kiowa, Comanche, and Wichita Agency, Indian Territory; Osage and Kaw Agency, Indian Territory; Pawnee Agency, Indian Territory; Ponca Agency, Indian Territory; Quapaw Agency, Indian Terri- tory; Sac and Fox Agency, Indian Territory; Sac and Fox Agency, Iowa; Kansas Agency, Pottawatomie Reserve, Kansas; Mackinac Agency, Michigan; White Earth Agency, Minnesota; Blackfeet Agency, Montana; Crow Agency, Montana; Flathead Agency, Montana; Fort Peck Agency, Montana; Fort Belknap Agency, Montana; Great Nemaha Agency, Nebraska; Otoe Agency, Nebraska; Santee Agency, Nebraska; Consolidated Winnebago and Omaha Agencies, Nebraska; Nevada Indian Agency; Western Shoshone Agency, Nevada; Abiquiu Agency, New Mexico; Mescalero Agency, New Mexico; Navajo Agency, Arizona; Pueblo Agency, New Mexico; Zuni Pueblo Day School, New Mex- ico; New York Agency, New York; Grand Ronde Agency, Oregon; Klamath Agency, Oregon; Malheur Agency, Ore- gon; Siletz Agency, Oregon; Umatilla Agency, Oregon; Warm Springs Agency, Oregon; Uintah Valley Agency, Utah; Fort Colville Agency, Washington Territory; Col- ville Agency, Washington Territory; Neah Bay Agency, Washington Territory; Puyallup, Nesqually, &c., Agency, Washington Territory; Quinalt Agency, Washington Terri- tory; S'Kokomish Agency, Washington Territory; Tula- lip Agency, Washington Territory; Yakama Agency, Wash- ington Territory; Green Bay Agency, Wisconsin; La Pointe Agency, Wisconsin; Shoshone and Bannock Agency; re- port of Shoshone school; report of Arapaho boarding school; report of the Ute commission; report of commission to re- appraise Kaw lands in Kansas; letter of Chief Spotted Tail to honorable Secretary of the Interior; Indian legislation by the third session of the Forty-fifth Congress, and the first session of the Forty-sixth Congress; proclamation by the President; liabilities of United States to Indian tribes,</p>			

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REPORT

OF THE

SECRETARY OF THE NAVY;

BEING PART OF

THE MESSAGE AND DOCUMENTS

COMMUNICATED TO THE

TWO HOUSES OF CONGRESS

AT THE

BEGINNING OF THE SECOND SESSION OF THE FORTY-SIXTH CONGRESS.



WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1880.

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REPORT OF THE SECRETARY OF THE NAVY.

WASHINGTON CITY, D. C.,
Navy Department, November 30, 1879.

SIR: I have the honor to submit the regular annual report of the condition and operations of the Navy Department for the fiscal year ending June 30, 1879. The expenditures for that period and estimates for the fiscal year ending June 30, 1881, are included.

The condition of the Navy has greatly improved during the last year. There are now in commission 45 vessels, consisting of cruisers, monitors, and torpedo boats. Of the different classes, 16 can be put in condition for sea service in a few months, and 20 could be made ready in an emergency. With this done the fighting force of the Navy, which might be made available in a very short time, would consist of 81 vessels of all classes. And if to this number be added the 4 monitors, *Terror*, *Puritan*, *Amphitrite*, and *Monadnock*, and 8 powerful tugs, which can be fitted for either cruisers or torpedo boats, our whole effective fighting force would consist of 93 vessels. The monitors could be completed, with the necessary appropriations, without much delay. Of the vessels now used as receiving ships, 7 are unfit for any other purpose. There are 27 vessels unfit for naval purposes of any kind whatever, but which are a positive expense, as it is necessary to keep in employment a force of ship-keepers to preserve them from entire destruction. Some of them might be profitably converted into merchant vessels, and it would be economy to sell the whole; in which event I repeat the recommendation heretofore made, that the Department be authorized to use the proceeds in either building new or repairing other vessels, instead of being required, as the law now directs, to cover them into the Treasury.

SQUADRONS.

THE EUROPEAN SQUADRON.—Rear-Admiral William E. Le Roy, having been relieved from duty as commander-in-chief, at his own request, Rear Admiral John C. Howell has been assigned to the command. Since my last report the *Vandalia* and *Marion* have been withdrawn from this squadron, for the reasons then stated, and the *Wyoming* and *Enterprise* have taken their places. The *Quinnebaug* has also been added. The *Gettysburg* was found to be entirely unfit for service. Her iron plates

were very much corroded and altogether unsafe, and her machinery broken down. She was an English-built vessel, was captured while running the blockade during the civil war, and was entirely unfit for a man-of-war. It being considered a dangerous experiment to venture across the Atlantic with her, she was sold at Genoa, Italy, under the direction of Rear-Admiral Howell, for \$10,983.46, and the money has been covered into the Treasury. The ships now composing this squadron are as follows: Trenton, Wyoming, Enterprise, and Quinnebaug. The Despatch has been detached and is now being repaired. The Alliance is on the way home.

THE ASIATIC SQUADRON remains unchanged in the command. The Kearsarge and Tennessee have reached the United States and have been repaired. The Tennessee will be ready for sea in a few days. The Monongahela has reached San Francisco, has been put out of commission, and now awaits such repairs as she may need. The following ships now compose this squadron, to wit: the Richmond, Ashuelot, Monocacy, Alert, Ranger, and Palos.

THE NORTH ATLANTIC SQUADRON.—After the transfer of Rear-Admiral Howell to the Mediterranean, Rear-Admiral Robert H. Wyman was placed in command of this squadron. The Tennessee will be attached to this squadron, and besides that vessel it will be composed of the Powhatan, Vandalia, New Hampshire, Pawnee, Kearsarge, and Nipsic. The monitors also remain attached to it.

THE SOUTH ATLANTIC SQUADRON.—Commodore E. T. Nichols, who has had command of this squadron, having been promoted to the rank of rear-admiral, and his cruise having expired, Commodore Andrew Bryson has been placed in command. The Hartford and Essex have been brought home for repairs and new crews, and the Shenandoah and Wachusett have taken their places.

THE PACIFIC SQUADRON remains under the same command as last year. It consists of the following vessels: The Pensacola, Lackawanna, Alaska, Tuscarora, Adams, Onward, and the Marion is under orders to join it without delay.

The ships assigned to special service are as follows: The Ticonderoga, Constitution, Minnesota, Michigan, Saratoga, Portsmouth, Rio Bravo, Tallapoosa, Alarm, Intrepid, Constellation, and Jamestown. The St. Mary's yet remains in possession of the city of New York, as a training ship in the interest of the merchant marine.

The Minnesota, Constitution, Saratoga, and Portsmouth, are in use as training ships for boys. The Ticonderoga is still engaged in special service on the coasts of Africa and through the Indian Seas, and when last heard from was at Aden, in Arabia, having had that far a most satisfactory and successful cruise. It is confidently expected that material benefits to our commerce will result from this expedition, and that it will become the means of establishing new relations between this country and the continent of Africa and the adjacent islands. The

Michigan remains upon the lakes. The Rio Bravo is continued in the Rio Grande River at Brownsville. The Tallapoosa is yet engaged as a transport vessel. The Constellation has recently sailed for Gibraltar, to transport a new crew for the Trenton, and to return from that ship those whose terms of service have expired to the United States. The Jamestown was sent to Sitka, in Alaska, during the last summer, to furnish protection to persons and property, there being at that time an outbreak threatened by the Indians. It yet remains there, and its officers have done much valuable work in surveying the harbors, erecting wharves, and otherwise examining into and reporting upon the condition of affairs.

The Plymouth has been put in ordinary in consequence of the appearance of the yellow fever which broke out last summer, and will be kept in this condition until it shall be satisfactorily demonstrated that she can be safely sent to sea again.

EXPENDITURES.

The amount of appropriations applicable to the current expenses of the fiscal year ending June 30, 1879, was, as stated in my last annual report, \$14,528,431.70. Subsequently, however, to the estimate of this amount an appropriation was made to cover deficiencies previously existing on account of pay due clerks, clothing undrawn, and military stores in the Marine Corps, which made the entire amount \$14,538,646.17. The net amount drawn from the Treasury by warrant during that period was \$13,343,317.79, as shown by the books of the Department. But the true net expenditure can only be shown by deducting the balances held by disbursing officers at the end of the year for outstanding salaries and bills liquidated and not paid, but which when paid enter into the current expenditures of the present year. This amount on June 30, 1879, was \$283,725.99, as shown by the books of the Fourth Auditor's Office, which, being deducted from the amount drawn out, leaves an aggregate balance unexpended of \$1,479,054.37 which stood to the credit of the Department at the beginning of the present fiscal year. There should, however, be deducted from this balance the sum of \$60,809 appropriated for the Naval Asylum, as that sum was brought to the credit of the asylum on March 24, 1879, by requisition in its favor, and is included in the exhibit of expenditures chargeable to Navy appropriations at that time as refunded and deducted from the amount drawn in that month. The net amount, therefore, which stood to the credit of the Department at the close of the year was \$1,418,245.37—that is, the total net expenditure for the fiscal year ending June 30, 1879, was that much less than the appropriations. Nearly all this unexpended balance stood to the credit of the office of the Secretary of the Navy and of the respective bureaus of the Department, as follows:

Secretary's Office.....	\$37,809 31
Bureau of Navigation	47,602 45
Bureau of Ordnance.....	37,564 04

Bureau of Equipment and Recruiting.....	\$183,003 12
Bureau of Yards and Docks.....	62,767 17
Bureau of Medicine and Surgery.....	16,734 52
Bureau of Provisions and Clothing.....	474,955 35
Bureau of Construction and Repair.....	17,513 51
Bureau of Steam Engineering.....	37,078 54
General account of advances.....	219,491 37
Amount in hands of disbursing-officers, as shown above.....	283,725 99

Total..... 1,418,245 37

In connection with this statement of the amount in the hands of disbursing officers, including those serving both on foreign and home stations, it is proper to say that the accuracy with which these balances are now ascertained is greatly owing to the fidelity of the pay corps of the Navy in making returns of disbursements; and I may, with propriety, add that there is not at the present time a single defalcation amongst all the officers of that corps to the extent of a dollar.

The following table shows the amount of expenditures by warrant and the amount refunded, as well also as that expended from the close of the year to November 1, 1879:

Exhibit of expenditure chargeable to Navy appropriations.

Date.	Drawn.	Refunded.	Expended.
APPROPRIATIONS FOR 1878-1879.			
1878.			
July.....	\$1,185,781 89		\$1,185,781 89
August.....	1,480,120 70	\$68,299 11	1,411,821 59
September.....	1,051,405 39	101 87	1,051,304 02
October.....	1,023,236 16	2,580 27	1,020,655 89
November.....	1,530,964 02	26,295 92	1,524,668 10
December.....	1,011,861 14	15,209 79	996,651 35
1879.			
January.....	1,554,148 82	623,290 31	930,858 51
February.....	2,161,249 23	705,147 49	1,456,101 74
March.....	1,786,606 26	934,231 68	852,374 58
April.....	1,971,401 72	1,017,520 11	953,881 61
May.....	2,370,481 16	914,224 67	1,456,256 49
June.....	5,423,534 99	4,920,572 97	502,962 02
	22,570,791 48	9,227,473 69	*13,343,317 79
APPROPRIATIONS FOR 1879-1880.			
1879.			
July.....	1,176,599 41	10,816 89	1,165,782 52
August.....	1,421,309 72	490,319 89	940,989 83
September.....	1,749,604 33	241,676 62	1,507,927 71
October.....	1,422,890 66	362,626 96	1,060,263 73
	5,770,404 12	1,095,440 33	4,674,963 79

* This is a statement by warrant and does not include the amount outstanding in the hands of disbursing officers June 30, 1879, which was \$283,725.99.

The total expenditures of the last fiscal year by warrant, after deducting the amount refunded, were \$36,403.70, nominally in excess of those of the previous year. As stated, however, the above table does not show the net amount chargeable to the Department, inasmuch as it does not include the balances in the hands of disbursing officers and not paid out before the close of the year. Besides this, also, a portion of the

above amount shown by warrant was expended pursuant to appropriations made for specific objects and not estimated for by the Department. These were to cover deficiencies for previous years 1875, '76, and '77, which had been omitted, for materials furnished the Jeannette in fitting out that vessel for her expedition to the North Polar Sea, and for other purposes not pertaining to the current operations of the Department. The total of these specific appropriations was \$212,392.30, which, deducted from the aggregate shown in the table, makes the aggregate expenditures as shown by warrant, for the fiscal year ending June 30, 1879, \$175,988.60 less than those for the previous year, and the actual net amount, including that in the hands of disbursing officers, \$459,714.59 less than the expenditures of that year.

The appropriations available for the present fiscal year, commencing July 1, 1879, are \$14,502,250.67. The amount drawn by warrant from the Treasury from July 1 to November 1, 1879, deducting that refunded, is \$4,674,963.79. The amount drawn by warrant during the same period of last year was \$4,669,563.39. This difference is more than accounted for from the fact that the disbursing officers hold in hand an excess of balances over the previous year.

ESTIMATES.

The following table will show the estimates for the fiscal year ending June 30, 1881:

ESTIMATES.

Pay of the Navy	\$7,546,725 00
Pay of civil establishment in navy-yards	196,199 50
Ordnance and torpedo corps	270,000 00
Coal, hemp, and equipment.....	800,000 00
Navigation and navigation supplies.....	104,500 00
Hydrographic work.....	46,000 00
Naval Observatory, Nautical Almanac	44,800 00
Repairs and preservation of vessels	1,500,000 00
Steam machinery, tools, &c.....	800,000 00
Provisions for the Navy	1,282,125 00
Repairs of hospitals and laboratories.....	30,000 00
Medical Department	45,000 00
Naval-hospital fund	50,000 00
Contingent expenses of department and bureaus	236,000 00
Naval Academy	187,344 45
Support of Marine Corps	851,145 00
Naval Asylum, Philadelphia.....	59,309 00
Maintenance of yards and docks	440,000 00
Repairs, &c., of navy-yards	375,000 00
	<hr/>
	14,864,147 95

This amount is \$361,897.28 in excess of the appropriations for the present year. In order, however, to ascertain the total difference between this estimate and the current estimates for the present year, the amount of specific appropriations not estimated for by the Department

for the next year but appropriated for the current fiscal year, should be added. These amount to \$208,281.72, which, added as above, will make \$570,179 as the total excess of the estimates for the next over the aggregate appropriations for the present year. This is made up as follows:

Pay of the Navy	\$303,450 00
Equipment and recruiting contingent	5,000 00
Provisions, Navy	257,125 00
Provisions and clothing, civil establishment	1,017 25
Civil establishment, yards and docks	4,900 00
Naval Academy	850 00
Quartermaster of Marine Corps	239 00
Steam machinery, civil establishment	282 75
	<hr/> 572,864 00
Deduct excess of appropriation for pay of Marine Corps over and above the amount estimated for	2,685 00
Total	<hr/> 570,179 00

Although the total excess thus shown is \$570,179, yet the actual amount, considered with reference to current ordinary expenditures is, as stated above, only \$361,897.28, which is thus accounted for:

The estimate for pay of the Navy made in my last annual report was \$7,350,000. This was ascertained by accurate calculation, taking the number of officers of all grades in the Navy and their pay as fixed by law, and the result was reached by the simple rule of addition. But Congress deemed it best to reduce the amount appropriated to \$7,243,275, or \$106,725 less than the estimate. This does not create a deficiency, inasmuch as pay of the Navy is necessarily a continuing appropriation; for the reason that it is the custom of paymasters of ships abroad to draw sixty and ninety day bills upon London, which cannot be regarded as disbursements until they are paid, and when they are drawn during the months of May and June cannot be taken into account until after the close of the fiscal year. The result is that it is impossible to strike a precise balance at the end of the year, of this particular fund, but the expenditure runs necessarily into the year in which the bills are paid. Consequently when the appropriation is short, it creates only a necessity for such an appropriation for any one year as will cover the shortage of the previous year. For example, if Congress had not cut down the estimate of the Department, the fund for the pay of the Navy would not have been short at the close of the last year; that is, there would have been money enough in the Treasury to have paid within the first quarter of the present year all the bills drawn during the sixty days preceding the close of the last year. But as the appropriation is a continuing one, all difficulty on this score will be overcome by adding the sum of \$106,725 to the appropriations of the present year, and the same amount to those of the next year, so as to prevent a like result then. These sums added make \$213,450. The remaining \$90,000 is the estimated amount made necessary for the next year by the system for training boys, that sum be-

ing considered sufficient for that purpose. This amount added to the \$213,450, makes a total of \$303,450, the amount of excess over the last appropriation for pay of the Navy, as above stated. The increased estimate of \$5,000 for the contingent fund of the Bureau of Equipment and Recruiting is rendered necessary by the increased expense of opening rendezvous in different parts of the country for the enlistment of boys, under the act of May 12, 1879, including transportation and the purchase of school-books.

The increase of \$257,125 on account of provisions is thus accounted for: At the last session of Congress the Department estimated for \$1,200,000 for provisions for the present year, but the appropriation made was only \$1,025,000, or \$175,000 less than the estimate. There has been thus far no deficiency on this account for the last year, but unless an appropriation shall be made to cover this amount for the next year there will in all probability then be one. As provisions bought for one year are not always consumed or issued until after the beginning of the next, especially where they are bought during the last quarter, the precise balances of the provision account, like that of pay of the Navy, cannot always be ascertained until after the beginning of another year. The remaining sum of \$82,125 is the estimated cost of provisions made necessary by the enlistment of 750 boys, authorized by the late act of Congress. These sums added make \$257,125, the whole amount of the increase. The \$1,017.25 is rendered necessary owing to the introduction of the system of manufacturing clothing which the Department has established at the Brooklyn navy-yard; the services of a writer or clerk are absolutely necessary in order that the accounts may be accurately kept. This sum is to cover his pay. The increased estimate on account of the Bureau of Yards and Docks is occasioned by a necessary increase to the civil establishment of that bureau, in this, there is one mail-messenger at each navy-yard, making seven in all, whose pay is fixed at \$700 per year. As this charge is properly against this bureau it has been deemed most appropriate to add the whole pay of \$4,900 to its civil establishment. It would not increase the aggregate expenditure of the Department, but is only designed to assign the employment and pay of these messengers to one bureau, which shall be held responsible. The increase in the civil establishment of the Bureau of Steam Engineering is thus accounted for: there is one clerk and one writer at the Boston navy-yard, who are now paid respectively \$1,300 and \$1,017.25, and both being of equal competency and performing labor alike, it is deemed expedient to equalize their pay by increasing that of the writer the amount asked for, that is, \$285.75. The difference of \$850 on account of the Naval Academy is thus accounted for: in the estimate an item of \$1,600 has been inserted for the pay of a dentist to attend the cadets, in lieu of an item of \$750 heretofore appropriated for the pay of an apothecary. The acting assistant surgeon, who has hitherto performed the duty of dentist, has been mustered out of the service in con-

formity with the act of Congress to abolish the volunteer navy. The amount of \$239 estimated for the quartermaster of the Marine Corps is made up of sundry items running through his estimates for the year commencing July 1, 1881, and is believed to be necessary to the service. The several items thus explained aggregate \$572,864, but in order to ascertain the aggregate of the excess, as explained above, there should be deducted \$2,685, which was the excess of the appropriations over the estimates for the present year. This leaves \$570,179 as the total excess over the appropriations of the current year, which this detailed statement is designed to explain.

NAVY PENSION FUND.

The following statement shows the number and yearly amount of pensions on the rolls June 30, 1879, and the amount paid during the fiscal year:

	On roll June 30, 1879.	Yearly value.	Amount paid for pensions.
Navy invalids	1, 844	\$211, 615 18	\$209, 003 03
Navy widows and others	1, 772	312, 675 30	324, 223 63
Total	3, 616	524, 290 48	533, 226 66

"PAY OF THE NAVY" AND "SMALL STORES."

Upon my recommendation to the last Congress provision was made for the separation of "small stores" from "pay of the Navy," by the act of February 14, 1879, which established it as a separate fund. By the operation of this law the "small stores fund" was set aside as a distinct account, and thus a perpetual inroad upon "pay of the Navy" was cut off. Deficits in pay were expressed in losses upon issues of stores, as explained in my last annual report, as well as in the sales of condemned stores, which never bring the original cost, and also in losses outright by the casualties of shipwrecks. These unavoidable losses gradually depreciated the small stores fund; and in future they will be expressed in figures, as has never been the case before. The needs of the fund can now be shown from year to year, and Congress can take into consideration any demonstrated deficiency, where one exists, and make provision for the same understandingly by appropriation, as has been done from time to time for clothing for the Navy.

There is another source of deficiency in the appropriation for pay of the Navy, which has remained undiscovered and has made yearly drafts for a number of years upon the money provided solely for the pay of officers and enlisted men. I refer to the loss on exchange and the expenses of transportation of money to particular points for disbursement and its transfer between paymasters. It is a very plain proposition that, when an amount is appropriated just equal to the annual requirements

for the disbursement of the fixed pay of the officers and men of the Navy, the amount so provided can not be legitimately used for any other purpose, nor be diverted from these necessary expenses without creating a deficiency, which would show itself whenever another settlement should be made with pay, such as that of the year 1877. I should state that this charge to pay has always been covered up, because a large unpaid balance remains in the Treasury, arising from the amounts due officers while at sea and the pay withheld from enlisted men. As one set of men are paid off and discharged another is enlisted; and therefore no period arrives for completely closing the appropriation account, which, as I have elsewhere stated, must be continuous, from the nature of the enlistments and three years' cruising.

Now, as exchange is charged to the appropriation and not to the officers and men, whose dues are never diminished by the exigencies of service in foreign countries, it is, of course, apparent that the appropriation must run short, and that the accumulation of such a charge for a series of years must eventually cause a deficiency. I am satisfied that this has been a serious charge against pay of the Navy, which has not been heretofore sufficiently accounted for. To remedy this I have caused pay to be divested of this burden, and have made a separate estimate for the exchange and transportation of money, which I am sure will have a wholesome effect in preserving pay intact. The origin of this practice seems to have been coincident with the disbursements of the Navy, and it is calculated to excite surprise to find to what extent pay of the Navy has been drained on this account, although the United States, as a rule, pay less for exchange than private parties. On July 1, 1877, I commenced with a clean balance-sheet, as announced at the time, and in the fiscal years 1876, '77, '78, and '79 there has been paid a discount or loss on exchange approximating \$75,000. Where it has been practicable I have dispatched money by authorized disbursing-agents, and also by express, and in this way have saved to the government the ordinary discount when these agents have been employed, and a large portion of it when the money has been transmitted by express.

The necessity and convenience of exchange can never be abridged. In this respect the United States occupies the same footing with other nations, cities, and business houses, who are always represented upon the great commercial thoroughfares of the world. The expense of exchange must always be met, because, without it, disbursing-officers would be obliged to take abroad with them sufficient amounts of funds to cover all liabilities of ships in commission, in every detail of expenditures. The appropriations for the Navy would be soon drawn from the Treasury, and the available balances for current home expenditures would be scattered in every direction, entirely out of the control of the department, until each disbursing-officer had returned home from his cruise and deposited his balance in hand in the Treasury.

NAVAL ACADEMY.

The death of Commodore Foxhall A. Parker, since the date of my annual report, created a vacancy in the office of Superintendent of the Naval Academy. It occurred during the progress of the annual examination in June, and I was enabled, being present, to realize how admirably he had managed the institution. The affectionate regard shown for him by the cadets evidenced how completely he had won their esteem by firm yet gentle and kind management, and the universal sentiment of those with whom he had been officially associated evidenced not merely his peculiar fitness for the position, but the faithful and zealous manner in which he discharged his official duties. His successor, Rear-Admiral George B. Balch, has always borne so high a character in the Navy, and possesses such eminent qualities as a man, as to assure the Department that he will be equally successful, and I take great pleasure in saying that, thus far, he has met my expectations. Under his superintendency the present term is progressing under the most favorable auspices.

The prosperous and satisfactory condition of the institution is fully set forth in the accompanying report of the Board of Visitors. The gentlemen who composed that board were patient and thorough in their investigations, and the conclusions reached by them were not only commendatory of the general management by the former Superintendent and the officers and professors who compose the Academic Board, but of the conduct and deportment of the cadets. Recognizing the fact that in such an institution, where the number of cadets is so large and their temperaments and inclinations necessarily varied and conflicting, seemingly harsh and severe rules are required to preserve discipline, they, nevertheless, say "that, as a general thing, the cadets observe the rules and regulations of the institution with the same alacrity and delight as they would have those to do in after life who may be placed under them in their respective commands."

The training in seamanship, navigation, and gunnery is as satisfactory and complete as possible with the facilities at command. In the opinion of the board, however, the vessels now used are not sufficient for thorough practice in gunnery, and they therefore recommend that a steam-vessel of 500 or 700 tons be provided for that purpose. The Department would find much difficulty in carrying out this recommendation by the use of any vessel in commission or undergoing repair, in consequence of the necessity of employing them in other and different service, and consequently submits the recommendation of the Board of Visitors to the consideration of Congress. If no congressional direction shall be given upon the subject, it will avail itself of all the means at its command to carry out this recommendation with as little delay as possible. The cost of this method of practice would not be increased beyond the present expenditure, while it would undoubtedly tend to produce

improvement in the practice of firing, because it would require a shifting instead of a stationary target to be followed.

It gives me great pleasure to speak in commendatory terms of the Academic Board. Its members have been selected with reference to their peculiar qualifications for the positions they respectively occupy, and have thus far, collectively and individually, demonstrated the wisdom of their selection. Their distinguished professional and scientific attainments have enabled them to make a course of study at the Academy as thorough and complete as it is at any like institution in the world. The standard of professional education now reached by the young officers of the Navy who graduate at this institution will compare most favorably with that recognized by any of the governments, and assures a continued course of efficiency in the management of our ships, both in peace and war, and of a capacity on their part to deal properly with the difficult and delicate questions which frequently arise out of international relations and are often submitted to the decision of naval officers.

Since the introduction of steam in our war-vessels the Department has recognized the absolute necessity of establishing a standard of professional education in the science of steam-engineering of the very highest character. Not only is it important that the principles involved in the structure of steam-machinery should be theoretically acquired, but without practical knowledge of the building of engines and boilers and the best methods of their management at sea, it is impossible to provide security against the many accidents to which such machinery is subject. In these respects the degree of success has been eminently satisfactory. But in order that the department of steam-engineering may be enlarged in the circle of its operations and duties, the Board of Visitors recommend that cadet-engineers shall be furnished with tools and facilities, which shall include appliances for iron-boat-building "and for laying down the lines of vessels and designing the detailed parts of the same." Whether this method of uniting the two professions of steam-engineering and construction should be adopted, is a question which I hesitate to decide affirmatively for reasons which seem to me satisfactory. They are not necessarily associated, even in building iron vessels, inasmuch as one involves the building and working of marine-engines, boilers, and machinery, and the other the lines and plans of vessels with reference to their tonnage, displacement, sailing capacity, and entire structure, no matter whether they be of wood or iron. The mere working in iron and other metals does not necessarily make a steam-engineer a naval constructor, any more than does the working in wood make a naval constructor a house-carpenter. At present, therefore, these two branches of service are separate and distinct, except that under the law as it now stands authority is given to appoint, as an assistant constructor, a graduated cadet-engineer, who shall, in the opinion of the academic board, have exhibited peculiar fitness for that pursuit. This might be done without any necessary conflict, but is attended with

this practical difficulty: that as the professors of steam-engineering are not educated as naval constructors, it imposes upon them the decision of matters not properly pertaining to their profession, and might place the cadet-engineer in the position of having to acquire a profession different from the one in which he had graduated. He might or might not make a good constructor, for it does not necessarily follow that the most ingenious builder of machinery is, in all respects, qualified to become a competent constructor of vessels of war. In all the European governments the two professions are recognized as entirely distinct, and in England naval constructors are specially educated in certain professional branches pertaining to the structure of ships, while those branches in which steam-engineers are especially educated are of a character wholly different. This policy is deemed preferable, as more consistent with the best interests of the service, and therefore I repeat the recommendation heretofore made by me, that Congress shall authorize the admission of a sufficient number of cadet constructors annually, as it has already done of cadet-engineers, so that after graduation they may have entire charge of that branch of the service. There is as much necessity for the one as the other. Chief constructors, at present, are taken from assistant constructors by promotion, while the department is left to select the latter from such ship-carpenters and others as may be recommended to it, and who may be supposed to have sufficient genius and talents to make chief constructors. Good and fortunate selections cannot be always assured so long as this practice prevails; and it is not desirable that it should remain a part of the permanent establishment of the Navy. The law confides to the Secretary discretionary power to make assistant constructors out of cadet-engineers, but I have declined to exercise this discretion, mainly for the above reasons. Two of these cadet engineers, however, have, with my approbation, recently entered the Royal College at Woolwich, in England, where they are pursuing a course of study as constructors, with such facilities as are furnished in the government dock-yards. The authorities of Great Britain admitted them, with great liberality, without the accustomed examination, and kindly accepted their graduating certificates obtained at the Naval Academy as sufficient evidence of their qualifications. They are young men of fine promise; and it is confidently expected they will return, after finishing their course, qualified to take any position connected with the construction of vessels. In the mean time, it is very desirable that Congress shall authorize such steps to be taken as shall recognize the necessity of having a corps of educated constructors graduated at the Academy, in order to provide for the future wants of the Navy.

Authority is given by existing laws for the education of midshipmen and others as naval constructors or steam-engineers, provided they show a peculiar aptitude therefor. This is left discretionary with the Secretary. By the same law he is allowed to form a separate class of cadet-

engineers, and otherwise afford them all proper facilities for such a scientific mechanical education as will fit them for steam-engineers or constructors. In the further provisions of the law, however, a practical distinction is made between steam-engineers and constructors in this, that the Secretary is authorized to appoint cadet-engineers to the number of twenty-five each year, but is not authorized to appoint cadet-constructors. This distinction is practically embarrassing. In the first place, when cadet-midshipmen are appointed from Congressional districts they enter the service with the hope and expectation of becoming officers of the line, all the grades and titles of which are open before them. And thus entering, there is no authority given to compel them, at the mere discretion of the Secretary, to change the whole course of their professional lives by making naval constructors out of them, and thereby take them away from the line and attach them to the staff. Nor would it be advisable to confer such authority upon the Secretary, because in many instances it might occur that cadet-midshipmen would prefer the course upon which they had entered, while the interest of the service, as viewed by the Secretary, might require them to adopt the other; and to force them against their will to make this change would not only be violative of the spirit, if not the letter, of the law which authorizes their appointment, but manifestly unjust to them. In the second place, cadet-engineers are appointed as such, and not as cadet-constructors; and they are required, like cadet-midshipmen, to render two years' service on naval steamers. Consequently, to divert them from the studies peculiar to this profession and turn them into another and different profession would be, in many cases, as unjust to them as to the cadet-midshipmen.

But the proper remedy may be furnished and the whole difficulty overcome if Congress will authorize the annual appointment of such number of cadet-constructors as may be deemed necessary to be educated as such. This will be simply to place cadet-engineers and cadet-constructors upon the same footing. Then each class will pursue the course of study adapted to its profession, and we may reasonably expect to realize within a few years the benefits of having well and thoroughly educated constructors as well as engineers in distinct professions. We shall then look to the former as other nations do—to lay down the lines and regulate the tonnage, displacement, and sailing qualities of our ships of war, and to the latter to furnish them with such engines, boilers, and machinery as will give them additional speed and secure perfect safety to them at sea.

I respectfully call the attention of Congress to the recommendations of the Board of Visitors in reference to the erection of new buildings and other improvements which they consider absolutely necessary. These are, a wing to the rear of the new building erected for cadet headquarters, a separate building for laundries, a new armory in place of a wooden shed now occupied for that purpose, and a new building for the

marine barracks. These improvements are not estimated for, but they are deemed of great importance to the institution, and I unite with the board in recommending them to the favorable consideration of Congress. Approximate estimates of their cost can be readily obtained.

NAVY-YARDS.

The work done during the year at the several navy-yards will appear, in detail, in the accompanying report of the Bureau of Yards and Docks. It has been regulated by the condition of the yards and the amount of the appropriations for that purpose. Although larger amounts of money might in all probability have been judiciously expended upon several of the yards, yet it has been the object of the Department to apply the amount at its disposal in the direction indicated in the estimates upon which the appropriations were based and with reference to immediate wants. The report of the bureau will show the nature of the work done at each yard, consisting of yard improvements, repairs and preservation, general maintenance, civil establishment, and contingent expenses. It was not deemed advisable to begin any new works or to make extensive repairs, for the reason that no special appropriations were made for that purpose. To have done so without such appropriations, indicating their approval, might have subjected the government to the possible loss of the money so expended, in the event of subsequent appropriations being withheld. Although the Department may possess the discretionary power to apply the general appropriations in this way, it is considered by me to be a safer and better course to await the more direct appropriation of Congress.

KITTERY YARD.—The dry dock was found in such condition as to require thorough repair. Being one of the most valuable belonging to the government and at one of the most important yards, this was done, but the work was so conducted as not to interfere with its use when needed. The total expenditure was \$67,011.23.

CHARLESTOWN YARD.—A special appropriation for repairing the rope-walk has been expended, and it has, in consequence, become one of the most valuable establishments of the kind in this country, if not in the world. It possesses the capacity to supply all the rope needed by the Navy, and of the best quality. Several small wooden buildings which were exposed to fires have been removed, but there are others in like condition which should be removed hereafter, as, in the event of fire, they would endanger the more valuable buildings. The great importance of this yard renders it necessary that it should be always kept in good condition. The caisson of the dry-dock is in a partially decayed condition, and in danger of becoming entirely unfit for use if not repaired. The caisson has been in use for nearly fifty years, and it would be bad economy to leave it to further decay. The total expenditure has been \$106,333.02.

NEW LONDON YARD.—The limited appropriations heretofore made have rendered it impossible to put this yard in a condition for general use. Having only a wharf and storehouse, and with only a single building suitable for residence, it cannot be used for either construction or repair. The harbor is very fine and admirably protected, and in reference to both it and the yard I can only invite attention to what was contained in my last annual report. The expenditures have been limited to actual necessity, and have been confined to a few repairs. The total amount was \$7,442.38.

BROOKLYN YARD.—What I have heretofore said of this yard may be repeated with great propriety. It remains in admirable condition. The annual expenditures are made with the view of preventing its deterioration and continuing its general improvement. The money expended there has been applied with both economy and propriety. The total expenditure was \$125,816.19.

LEAGUE ISLAND YARD.—This yard was greatly damaged by a severe storm during the year. About 1,400 feet of the dike was washed away and nearly the entire island was submerged to the depth of from 3 to 7 feet. Considerable material was swept away. This had, necessarily, to be repaired out of the general fund, as there was no other applicable to that purpose. With all the means at the disposal of the Department, it has only been able to make repairs of a temporary character. The yard will be left subject to great future injury unless they are made permanent. The total expenditure was \$121,840.26.

WASHINGTON YARD.—The value and importance of this yard has, in no sense, diminished. Its manufacturing facilities have steadily increased. The rolling-mill, erected a little over a year ago, has proved a complete success, and has already saved to the government more than its cost. The public interest requires that its boundaries should be somewhat enlarged, and I approve the recommendation of the Bureau of Yards and Docks in reference thereto. The yard has been kept in excellent condition, and the expenditures have been made most judiciously and with commendable economy.

The necessity for improving the East branch of the Potomac river has become absolute. If it is not done access to this yard may, in a short time, become impossible, except with vessels of very light draught. The mud and sand washed in from the adjacent high-grounds is rapidly filling up the channel, so that vessels are now frequently grounded in attempting to reach the yard. Appropriations heretofore made have contemplated the improvement of the Potomac from Georgetown to Alexandria, and have had no reference to the East branch. The longer they are delayed the greater will become the difficulty of opening the channel, and good economy would seem to require that it should be done immediately. The total expenditure was \$90,184.42.

NORFOLK YARD.—The buildings, wharves, and roadways at this yard suffered great injury in August last in consequence of a violent storm.

The repair of these required an extra expenditure, and, so far as it has progressed, the money has been judiciously expended. In a short time it is believed that the yard will be again put in good condition. This is a most important and valuable yard. The harbor is one of the best upon the Atlantic coast, and the climate is such that work can be done during the whole year. Without the re-erection of timber-sheds, the valuable timber now on hand will be subject to great decrease in value from exposure to the weather. The total expenditure was \$108,648.71.

PENSACOLA YARD.—I desire to call attention to what was said in reference to this yard in my last annual report. As it stands alone upon the Gulf, and has such large quantities of live-oak timber adjacent to it, there is every reason why it should be no longer neglected. During the year nothing was done except what was necessary to its preservation. The section-dock heretofore authorized by Congress, and built at Chester, Pa., has been so far advanced that two sections of it were transported to the yard during the last summer. They escaped all the perils of the sea, and are now ready to be put in use, as originally contemplated, when the remaining sections are finished. The total expenditure was \$52,731.07.

MARE ISLAND YARD.—The special appropriation of \$75,000 for the dry-dock has been expended, and the work has progressed most satisfactorily. The entrance to it is now protected by a coffer-dam, which is liable at all times to give way, and the work should be pressed forward as rapidly as possible to a point where better protection shall be secured. The great importance of this yard commends it to the special consideration of Congress. It being the only one upon our Pacific coast, it is the exclusive representative of the Department in repairing vessels attached to the Asiatic and Pacific squadrons. Consequently it should be put and kept in thorough condition. Up to the present time as much has been done in that direction as could possibly be done with the money allowed. The total expenditure has been \$185,712.98.

SACKET'S HARBOR.—At this station the government owns a ship-house, in which there is the frame of a line-of-battle ship, which has been lying there a great many years, and is rapidly decaying. Although a portion of the building has been injured by a gale of wind, yet it has not been advisable to repair it, inasmuch as neither it nor the frame of the ship is considered by the Department as having any actual value. It is hoped that Congress will direct the disposition of this property. The sum expended in taking care of it was \$916.72.

KEY WEST.—Nothing more could be done at this station than to make some slight repairs to the buildings and shops and to renew the wharf. This place is frequently visited by our vessels, and the interest of the service requires that it should be ready at all times to furnish them with necessary assistance. The total expenditure was \$6,999.31.

NAVAL ASYLUM.—At the close of the last fiscal year there were 167 beneficiaries at this institution. Their condition is rendered as comfortable as possible at a total expense of \$50,259.32.

THE TRAINING SYSTEM.

The importance of the system which authorizes the training of boys for seamen cannot be over-estimated. Thus far it promises complete success, and if persevered in will undoubtedly supply the Navy with a body of men to whom our ships may be safely intrusted while at sea, and upon whose courage and patriotism the country may confidently rely in time of war. No nation can safely intrust the keeping of its honor to those who do not feel that they owe undivided allegiance to it, and as the Navy has borne so conspicuous a part heretofore, and will undoubtedly bear an equally conspicuous part hereafter, in every measure required to preserve our national honor, all the means necessary to make it thoroughly American should be encouraged. The British navy has the reputation of being unsurpassed in its *personnel*, and as it has acquired this distinction mainly by means of its training system, we may be reasonably assured that by a proper development of our own we may obtain a like result.

At the time of the passage of the act of May 12, 1879, there were 945 boys enlisted and serving as apprentices. These were enlisted under a previous general law, which made it discretionary with the Department, but greatly restricted the exercise of this authority by considering the apprentices as part of the 7,500 seamen authorized for the service. The recent act, however, authorizes the enlistment of 750 boys in addition to the previous force, which increases the whole number of seamen to 8,250.

Soon after the passage of this act measures were taken to extend facilities for these enlistments into the interior of the country, as far west and south as the States bordering on the Mississippi river, and as far northwest as the States bordering upon the lakes, while, at the same time, recruiting was continued in the seaboard States. The result has been more favorable than was anticipated, and 420 boys have been enlisted since the passage of the law, who for sprightliness, vigor, and robust constitutions are unsurpassed by any other like number of the same ages in the country. These added to those previously in the service make the total number 1,365, nearly one-seventh of the whole body of seamen. Of this number, however, 625 of former enlistments have been placed for sea-service on board of several of our cruisers, and the Department has great satisfaction in being able to say that, in every instance where they have been detailed for that purpose, their conduct has been so universally good as to elicit the warmest praise from all the officers in command of them. Several officers have specially commended them.

Recent personal intercourse with the greater part of these boys has convinced me that they, with very few exceptions, are ambitious to distinguish themselves in the service. Many of them possess a high degree of intelligence, and the education of all in an elementary course of learning is carefully looked after. As they mainly represent the industrial

classes, and promise to be of much value to the naval service, it is worthy of consideration whether it is not desirable to adopt some line of policy towards them which shall excite a proper spirit of emulation in their ranks. This may be done by authorizing medals of honor to be conferred upon those who shall show themselves to be most meritorious. Something like this would tend very greatly towards elevating the moral standard of the service, and stimulate them to put forth their best energies.

Complaints have reached the Department from some of these boys and their parents of the unsuitable character of the Navy ration as food. It is quite natural that these complaints should be made, for it is scarcely to be expected that boys between the ages of fifteen and eighteen, who have been accustomed to home comforts and diet, will be immediately reconciled to food prepared for older and hardier seamen. But the Department has no discretion on this subject, as the constituent parts of the Navy ration are regulated by law, and no substitution is allowed except in the cases of senior officers in command, and the mere exchange of coffee and sugar for the extract of coffee combined with milk and sugar. It is recommended that discretionary power be given to change the rations for boys so as to make them more suitable to their ages and condition.

No good reason is perceived why these apprentice boys should not be allowed their clothing without charge. At present the price has to be deducted from their pay, while all the soldiers in the Army are supplied with clothing without cost to themselves. The expense is trifling compared with the injustice of such discrimination, and I respectfully recommend that this inequality shall be removed. Strict justice requires that all seamen, in this respect, shall be placed upon the same footing with soldiers; but, at all events, that the apprentice boys should be exempt from this charge, which the most, if not all, of them are ill able to bear.

SANITARY REGULATIONS.

Not alone with reference to naval vessels, but to those belonging to the mercantile marine, has it always been considered of the highest importance that proper precautions should be taken to secure healthfulness to their crews. As they visit the various ports of the world, they may, if in an unhealthy condition, carry along with them the worst forms of contagious diseases, and thus scatter pestilence and death, in the most infectious forms, throughout districts otherwise exempt from them. There is no convincing evidence that the yellow fever has been produced in the United States by any local causes in those cities and sections where it has hitherto prevailed. The facts furnished by the experience of former years, when it existed only in seaport cities, would seem to warrant the conclusion that it must have been imported by vessels from abroad, bringing it from those tropical regions where it had been generated among populations exposed to the influences of a warm climate,

and where sanitary precautions were unknown. Whether the recent prevalence of this disease in the interior of the country has furnished any facts in disproof of this theory, scientific research can alone determine. And as science, in the solution of this important problem, is the representative of the whole country as well as of humanity, whatsoever is done in that direction is of national importance. If the assumption that the disease is not indigenous shall be found to be true, then our attention must be turned in the direction of endeavoring to adopt such sanitary and precautionary measures as shall prevent its introduction in the future. And if, on the other hand, it shall be ascertained that its germ has been deposited and left in a torpid state during the winter to be developed into activity during the summer months, then it will become still more important that some method for its destruction shall be discovered.

Little success has been attained, up to the present time, in demonstrating that epidemic diseases have a germ origin. Recent scientific research at Rome has given rise to the belief that the malarial poison in the Pontine marshes exists in minute animalculæ, which float about unperceived in the air and water, and are susceptible, under proper conditions, of infinite distribution. The investigations leading to this discovery were conducted with the utmost care and precision, and whether the conclusions reached shall be finally adopted or not by the scientific world, they have opened a field for further experimental research. And if, in the end, it shall be ascertained that the yellow-fever germ actually exists, a way may then be opened for the introduction of efficient means of preventing the disease altogether, or at least of restricting its dissemination.

When this disease made its appearance on board the United States steamer *Plymouth*, in the summer of 1877, it was not attended with such fatality as to create any unusual degree of alarm. The skillful attention of the naval medical officers was sufficient to assure control over it, and the number of deaths was comparatively few. The ship, however, was subjected to thorough fumigation in the most approved modes, besides being exposed to the lowest degree of cold that could be reached in an exposed condition in latitude 44° north. But the utmost care was not sufficient to prevent the disease from making its appearance again in the summer of 1878, when the ship was returned to a tropical climate. In the case of the United States steamer *Susquehanna*, some years before, the experience was substantially the same. Consequently the *Plymouth*, like the *Susquehanna*, was put out of commission, stripped of all her equipment, and yet remains in a proper condition for such further experiments as may become necessary. It is hoped that, as the disease did not reappear on the *Susquehanna* after the second winter, a like result may be produced with the *Plymouth*; but, in the mean time, the Department continues to employ, through its medical officers, all possible diligence in investi-

gating the causes of the disease, the various and most approved methods of preventing its introduction, and the best means of purifying the atmosphere of ships by ventilation. With the means now at its disposal, these investigations must necessarily be more limited than is desirable, but they will be carried as far as possible. And if it shall be the pleasure of Congress to adopt the suggestion contained in the accompanying report of the Bureau of Medicine and Surgery, and authorize the establishment of a station on our coast where infected vessels may be sent and experiments made to discover the best and surest methods of disinfection, the results reasonably to be expected would without doubt be more satisfactory. These are important and valuable suggestions; and although the amount necessary to put them in practice has not been estimated for by me, inasmuch as it does not constitute a necessary part of the current expenditure, yet, in my opinion, the same amount of money could not otherwise be better, if so well, expended. I therefore recommend the adoption of the proposed plan, and do so the more readily because the trained experience and abilities of the medical officers of the Navy, the knowledge acquired by them in witnessing the effects produced by climatic influences, and their familiarity with the various conditions of the atmosphere in the several parts of ships, peculiarly fit them for this important work.

When an epidemic is prevailing very little time is afforded to the medical attendants for scientific investigation into the causes which produced it. Those to whom this work should be confided ought not only to be specially fitted for it by scientific training, but be freed from the care and responsibility of the sick, while at the same time they should have access to sick-rooms in order to make atmospheric observations, both with a view of ascertaining whether any organic germs existed and to mark the effects of fumigation.

The Department assigned medical officers of the Navy to duty at Memphis and the West Indies, who acted under the general direction of the National Board of Health. They rendered important services and gained valuable knowledge. It is desirable to utilize this experience and to prepare a greater number of these officers for the investigations above stated; and no better school for this purpose could be established than the station recommended by the bureau, at some point upon the coast where our ships of war could immediately resort for disinfection in case of epidemics of yellow fever breaking out. The ships could be made ready for sea again with but little delay, and in time of war the advantages of such a resort would be incalculable.

As the means at the disposal of the Department have necessarily limited the experiments thus far, investigations have been confined mainly to observations on shipboard, at shore stations, and in foreign ports, with a view to decide the relative merits of the various modes of artificial ventilation. It is necessary to health that the air should be kept in motion in all parts of a ship, whether stationary or afloat, and

numerous contrivances for this purpose have been invented. Some of them answer the purpose reasonably well when a ship is moving, while they produce no perceptible effect while she lies at anchor, when foul air rapidly accumulates. Desirous of ascertaining the best of these methods, the Department, during the last year, while the United States steamer *Richmond* was undergoing repair, introduced a plan on board that vessel, which, after investigation, seemed to promise the most favorable results. Complete ventilation has been obtained by it, and it is believed that the *Richmond* is now the best ventilated ship of war in our Navy, if not in the world. During her recent voyage from New York to Shanghai, the temperature of her berth-deck varied from 67° to 80° Fahrenheit, and of her spar-deck from 48° to 84°, so that the temperature of the air on both decks is about the same. Besides this method of ventilation, however, large quadrangular air-ports have been introduced in place of the small round ones so common in our ships, and these have contributed greatly to the admission of fresh air. The two causes combined have produced the most gratifying results and have materially diminished the sick-list. Although it would seem that the value of such a ventilator as that now upon the *Richmond* could scarcely be estimated, yet it is considered too costly to be introduced upon all our ships undergoing repairs without increased appropriations for that purpose. Investigations will be continued, however, with the view of ascertaining whether it cannot be more economically constructed, and it is hoped that among the great variety of plans some suitable one may be found, so that it may be introduced into general use, not alone in the Navy, but also among merchant vessels, where ventilation is so much needed to prevent injury to their cargoes.

THE RULES OF THE SEA.

The law as it now stands prescribes a set of rules for the navigation of vessels, which are designed to prevent collisions at sea and on inland waters. It is believed that they embody, in their general features, what has come to be known as the laws of the sea, and furnish, in the main, reasonable security against collisions. But in their administration some practical difficulties have arisen which deserve Congressional attention.

The ocean highway being free and all vessels being equally liable to the accident of collision, the most perfect understanding and unanimity is necessary in formulating rules for the guidance of vessels meeting and passing upon the sea or navigable rivers and bays. It is desirable that this unanimity should be international, certainly in so far as the navigation of the sea is concerned, that is, that it should be attained by similar laws enacted by all the maritime nations. General laws of this nature would serve as the basis for subordinate and separate national legislation. But inasmuch as no such unanimity has been secured by international arrangements between the United States and other gov-

ernments, it is, in every sense, important that we should secure it in our own.

The mariners of all nations are separated into two completely independent divisions—the navy and the merchant marines. In every nation these two divisions are subjected to entirely independent control, so far as the exclusive interest of each service is concerned. But in all the nations, except the United States, both the naval and mercantile marine are affected by some mutual system of rules, governing both divisions. Here no mutual action has been secured, and if ever attempted it was a failure. Some means of making it a success should be adopted, and the subject is important enough to invoke the careful scrutiny of Congress.

The Secretary of the Navy is empowered by law to make rules for the guidance of naval vessels, but is not bound to consider the necessities or conveniences of the merchant marine, or to communicate these rules to merchant captains. The Board of Supervising Inspectors are empowered to make rules for the guidance of merchant vessels, but naval vessels are exempt from following them, and are not required to be notified of them. Foreign vessels are, by statute, exempted from both the naval and merchant rules, and follow only those of their own nations. Coast-Survey and light-house vessels are under the control of the Treasury Department, but are officered by naval officers, and have no rules for their special guidance except such as they elect to follow. Such an anomalous condition of things ought not to exist, and frequent collisions at sea may be expected while it does exist.

The rules issued some years ago by the Navy Department were exclusively designed for the guidance of naval vessels, and were prescribed without any reference to the special needs of the merchant service. The statute of 1877, with regard to the rules of the sea, was prepared without reference to the special necessities of the Navy, and naval officers have been left to discover, as opportunity offered, the differences between it and the former laws upon which the naval rules were based. As the inevitable result of this want of unanimity, both the rules governing the Navy and those governing the merchant marine are, in some respects, faulty, and their instructions in several points are supposed to be in direct conflict.

It is understood that new rules have been submitted by the English Government to the United States, which may invite legislation. They have not been submitted for the examination of the Navy Department, and if they have been to the Board of Supervising Inspectors, no notice thereof has reached the Department. The presentation of them, however, makes the occasion a proper one for an effort to secure international unanimity if possible, and if not, for securing harmony in our own system. It is undoubtedly true that some method of joint action between the controlling authorities of the naval and merchant service is absolutely necessary wherever the interests of both kinds of service become

identical. This object would, in all probability, be accomplished by the organization of a board representing the Navy, the Board of Supervising Inspectors, and the revenue service, to whom should be intrusted the decision of all questions in which the whole marine service is alike interested. The suggestion of this method is only made with a view to inquiry and whatsoever legislation Congress shall deem expedient.

OBSERVATORY.

The accompanying report of the Superintendent of the Naval Observatory will show that it has not lost any of its claims to the public favor. Its services to the cause of science are of incalculable value, and, as it has already reached the front rank among the kindred institutions of the world, the question whether or not it shall receive additional favors and protection from the government does not seem to be debatable.

I desire to call special attention to that part of the report of the Superintendent which has relation to the malarious influences to which the present site of the observatory is subject, and to add my own to his recommendation for the purchase of a new site. It is very desirable that this should be done without delay, not only on account of health, but because economy requires that the purchase should be made before there shall be a large increase in the value of real estate, which seems probable in the near future. There are 1,075,865 cubic yards of earth in the grounds upon which the buildings stand, which can be removed, in order to make the lots correspond with the grades of the city streets and a proper grade to the river front. The removal of so large a quantity of earth will contribute materially to filling up a large number of acres in the adjacent river flats.

MISCELLANEOUS.

No new ships have been commenced since those authorized by the act of March 3, 1873, but some of those previously built have undergone so extensive repairs as to make them comparatively new in all parts except their frames, and in the cases of the Quinnebaug, Nipsic, and Galena, they may be considered as entirely new. Where the frames are of live-oak they have shown very little sign of decay, even after twenty-five or thirty years of service. Consequently, in the construction of ships of war we are, in some degree, behind the European maritime powers, although some of our vessels, as the Trenton, Marion, Vandalia, Swatara, Quinnebaug, Galena, Essex, Enterprise, Adams, Alliance, and Nipsic, are such fast sailers and good sea boats as to compare favorably with the best foreign vessels of war of their classes. The largest part of our Navy, however, is composed of vessels of the old types, and while some of them possess excellent qualities, and are equal to any in the world of the same types, yet the Navy, as a whole, cannot be brought up to the modern standard of naval architecture until we shall

avail ourselves of existing improvements. We do not need so large a navy as the great maritime powers of Europe. They are crowded so closely together, and are so perpetually engaged in contests for supremacy, that strong navies are as essential to them as immense armies. Hence they expend large sums of money in experiments, in order to add to the efficiency of their vessels of war, not only as regards their speed but their qualities of attack and defense. While, therefore, we have adhered to the old types of vessels, they have introduced new ones, supposed to combine these qualities in a greater degree than has hitherto been reached. But whether in these respects they have surpassed us, and if so to what degree, remains an open question.

We cannot dispense with a navy, whether it be regarded with reference to defense or in its relations to our commerce. None of the nations are in a condition to do without strong armaments at sea, any more than to do away with preparations for defense on land. Our position does not exempt us from the necessities common to them all, but rather demands of us, in view of our rapid growth and increasing importance, that we should promptly recognize and act with reference to them. The most of the vessels of war of the European powers are, like our own, of the old types, and not superior to those of our Navy. Those only of recent construction are of improved types, and of these we can avail ourselves in the future improvement of the Navy, as they have heretofore done of improvements made by us. With the view of ultimately securing a combination of these advantages with such others as we possess ourselves, I directed the Bureau of Construction and Repair, more than a year ago, to direct the attention of our naval constructors to the necessity of laying down the lines and preparing plans for new ships of war, with reference to the best modern improvements. Some of these have been already furnished to the Department, and others are in such an advanced condition that they can be made ready whenever Congress shall deem it advisable to authorize new vessels to be built. In the mean time, the preparation of these plans furnishes a favorable opportunity to our naval constructors to improve themselves in the science of their profession. It excites a generous and commendable emulation amongst them, which cannot fail to result in benefit to the government, by securing such types of vessels, when new ones shall be built, as shall compare favorably with those of any of the modern nations. It is not believed that any people in the world possess a higher degree of mechanical genius than ours.

Apart from the question of the plan and type of ships of war is that of the material out of which they shall be built, whether of wood, iron, or steel. For unarmored ships wood is unquestionably superior to iron or steel. A heavy shot striking near the water-line of an iron ship and going through both sides would cause such damage, particularly in the side where passing out, that it would be impossible to stop the water, and would probably result in sinking the ship. A wooden ship perfo-

rated in the same manner could be far more readily kept afloat, the advantages of water-tight compartments being the same in both vessels. The great cause of complaint and dissatisfaction with wooden ships arises from their early decay, resulting from a law of nature never yet entirely overcome. Many unsuccessful efforts have been made to do this, but thus far practical tests have not demonstrated the thorough efficacy of any of them. I have caused a process of preservation to be applied to a quantity of timber at the Boston navy-yard, which promises satisfactory results, at least to the extent of greatly increasing its durability. It will, however, require a period of time sufficiently long to compare it with timber in its natural state, in order to ascertain its full value. If by this or any other method it shall be satisfactorily shown that the natural decay of white-oak and yellow-pine timber can be arrested so as to give them something like the durability of live-oak, it does not seem probable that wooden ships of war will be abandoned for those of either iron or steel. And if they shall not be, then the immense growth of timber in our country will be useful in the future, as it has been in the past, in the construction of our unarmored ships of war.

Although immense sums of money have been spent by European powers in the construction of heavily armed and armored iron ships of war, it has by no means been proved that the plans of these ships are superior to the plans of our monitors. The armament and armor are undoubtedly superior, and the contest for supremacy between ordnance and armor is still going on. There is no reason now apparent for supposing that our type of iron-clads, when armed and armored in accordance with the ideas now prevailing, will be inferior to those of foreign powers. On the contrary, there is much reason for believing they will prove to be superior.

There have been no extensive purchases of timber during the past year. Only that required for special purposes has been obtained. There was on hand at the several yards, January 1, 1878, of live-oak 1,664,988 cubic feet, and of white oak and yellow pine 1,569,112 cubic feet. If all this timber shall prove to be of as good quality as was called for by the contracts under which it was purchased, it would be sufficient to build a number of ships of the Alaska class; and, consequently, with this large stock on hand, it will not be necessary to make any further immediate purchases, except for special purposes, unless Congress shall authorize new ships to be built. In this event, it will be desirable to increase the stock on hand to the extent of providing well-seasoned timber for future use.

In my last annual report I expressed the views entertained by the Department in relation to the double-turreted monitors now in progress of construction, and which were commenced under the act of June 23, 1874. I can only repeat what I then said, adding that these vessels necessarily deteriorate in value by delay in their completion, and that when completed it is believed they will be unsurpassed by any similar

vessels of war in the world. They will add very materially to our defensive force necessary to guard the entrances to our harbors and protect the cities of our Atlantic seaboard. The Department has not felt at liberty to apply any of the current appropriations to work on these monitors. That portion subject to expenditure by the Bureaus of Construction and Repair and Steam Engineering has been used in making the necessary repairs to vessels, engines, and boilers, and in building new boilers and casting new propellers. Repairs have been made upon 76 vessels, being small upon some and necessarily large upon others. There were 10 engines, boilers, and dependent machinery thoroughly repaired, 16 new boilers built, and 3 new screw propellers cast. The whole of this work has been well and satisfactorily done, and the details of it will be found fully set forth in the reports of these two bureaus. Such also is the case in reference to the entire operations of the Department, the business of each branch of the service being explained in the reports of the several bureaus. Taken together they show that the interest of the government is carefully guarded and that of the service promoted. But for the general and cheerful co-operation of the officers of the Navy neither of these objects could be accomplished.

R. W. THOMPSON,
Secretary of the Navy.

The PRESIDENT.

SUPPLEMENT.

DETAILED MOVEMENTS OF VESSELS.

NORTH ATLANTIC STATION.

Rear-Admiral Robert H. Wyman relieved Rear-Admiral John C. Howell of the command of the force on this station January 17, 1879, which now consists of the following-named vessels: Powhatan (flag-ship), 17 guns; Vandalia, 8 guns; Marion, 8 guns; Kearsarge, 6 guns. The Tennessee, 23 guns, is fitting out at the navy-yard, New York, as flag-ship of this station, and the Marion is fitting out for duty on the Pacific Station. The Nipsic, 6 guns, will be ordered to duty on this station.

The iron-clad monitors Ajax, Catskill, Lehigh, Mahopac, and Manhattan are still continued in partial commission and are anchored in the James River, Virginia; and the Montauk, Wyandotte and Passaic (the last named being used as a receiving vessel) at the navy-yard, Washington.

The New Hampshire and Pawnee, store-ships, remain at Port Royal, S. C.

Since the last annual report, the Plymouth, 12 guns, having become infected with yellow-fever, has been put out of commission.

The iron-clad monitor Canonicus, which was anchored off New Orleans, La., left there May 10, 1879, arrived at the navy-yard, Pensacola, Fla., the 12th, and was put out of commission the 27th.

The Powhatan left New York November 23, 1878, and arrived at Norfolk, Va., the 26th. Rear-Admiral Wyman hoisted his flag, January 17, 1879, and sailed February 1, reached San Juan de Porto Rico the 7th; St. Thomas, the 11th; Frederickstead, St. Croix, the 15th, and Port au Prince, Hayti, the 21st; left that evening for Havana, Cuba, which port she reached the 24th. On the 26th sailed for Key West, Fla., for coal, and departed from the last named place March 4 for Puerto Cabello; arrived there the 11th, and inquired into the seizure of the American schooner Marcia Reynolds, during the revolution in Venezuela; remained there until the 13th, when sailed for St. Thomas, reaching there the 16th; sailed thence the 20th, and arrived at Hampton Roads, Va., the 27th. On the 15th of May she sailed for Port Royal, S. C., arriving there the 18th, and leaving the 22d to return to Hampton Roads, where she arrived the 25th. On the 18th of June sailed for New York and arrived there the next day; sailed July 5, reached Vineyard Haven, Mass., the 7th; departed thence the 10th and arrived at Portland, Me., the following day. On the 18th of July Rear-Admiral Wyman transferred his flag temporarily to the Marion at the Kittery navy-yard, and the Powhatan left the same day for the League Island navy-yard, where she arrived the 21st. Proceeding to Chester, Pa., she took in tow one section of the dry-dock built for the navy-yard, Pensacola, Fla., left with it the 29th, and arrived at that navy-yard August 14, having successfully towed the section of the dock thither. On the

16th sailed for New York and arrived there the 24th. Rear-Admiral Wyman again hoisted his flag on board the 27th. The Powhatan remained at New York until September 20, when she sailed for Hampton Roads, Va., arriving there the 23d; left October 2 for Annapolis, Md., reaching there the following day and returning to Hampton Roads on the 11th. Left there November the 10th and arrived off the New York navy-yard the 12th.

The Plymouth left St. Croix, West Indies, November 7, 1878, on account of yellow-fever cases contracted there, and arrived at Norfolk, Va., the 18th; departed the 23d and reached Portsmouth, N. H., the 30th; sailed thence to Boston, Mass., where she arrived December 17. After having been repaired and thoroughly fumigated, she sailed March 15, 1879, and, when in latitude 27° north, she turned back in consequence of cases of yellow fever having broken out on board, and arrived at Wood's Hole, Mass., April 2; she reached Portsmouth, N. H., April 7, and was put out of commission May 17.

The Vandalia arrived at the navy-yard, Boston, January 13, 1879, from the European station; left that yard April 7, and reported at Norfolk, Va., the 13th for duty on this station; left the 19th, reached Kingston, Jamaica, the 29th; sailed May 3 and arrived at Aspinwall the 7th; left the 18th and reached Hampton Roads June 10, having stopped at Port Royal on her way. Sailed on the 18th, reached New York the next day, and left for Huntington, Long Island; New London, Conn.; Newport, R. I., and New Bedford, Mass.; visited those places, and, under orders of the department, proceeded to Chester, Pa., to assist the Powhatan in towing the iron sectional dock to the navy-yard, Pensacola. Left Chester, with a section of the dock in tow, July 29; put into Port Royal August 5 for coal; left the 8th and arrived at Pensacola with her tow the 19th. On the 30th she sailed, and arrived at Aspinwall September 12, and after a lengthy stay there reached Vera Cruz, Mexico, October 30; remained a few days, and proceeded to New York via Key West.

The Marion arrived at the New York navy-yard January 19, 1879, from the European Station; left that yard March 24, and reported at Norfolk April 8 for duty on this station. Sailed May 16, reached Key West, Fla., the 22d; left the 25th and anchored on the 31st off Sacrificios Island (Vera Cruz, Mexico); sailed June 4 and arrived off Tampico the next day; left the 6th, reached Pensacola the 12th; departed the 16th and arrived at Hampton Roads the 26th, having stopped at Port Royal on her way. On the 27th left for Portsmouth, N. H., where she arrived July 4. On the 19th Rear-Admiral Wyman hoisted his flag on board, having transferred it temporarily from the Powhatan, and again transferred it to the Powhatan August 25. Sailed for Hampton Roads October 10, where she arrived the 14th. On the 18th of November left the navy-yard, Norfolk, and arrived at the New York navy-yard the 24th, where she is preparing to proceed to the Pacific Station.

The Kearsarge was put in commission at the navy-yard, Portsmouth, N. H., May 15, 1879; sailed June 21, and reported at New York on the 24th for duty on this station. On the 2d of July sailed on a cruise to Newfoundland, St. Johns, Placentia, Charlottetown, and Halifax. On the 4th of August she was ordered to Shediac to receive on board commissioners appointed by the Department of State, and from thence cruised in that vicinity under their direction. She returned to the United States on the completion of this duty, arriving at the navy-yard, Boston, September 14; left there the 30th and arrived at Annapolis, Md., October 5; sailed thence the 9th and reached Hampton Roads the following day.

SOUTH ATLANTIC STATION.

Rear-Admiral Edward T. Nichols continued in command of the force on this station until November, 1879. The flagship *Hartford*, 18 guns, having been ordered home, he was directed to return with her, and arrived at the navy-yard, Boston, November 17.

Commodore Andrew Bryson hoisted his flag as commanding the force on this station September 26, 1879, on the *Shenandoah*, 11 guns, at New York, and left there with that vessel for Rio de Janeiro, Brazil, October 10.

The *Wachusett*, 6 guns, left the navy-yard, Boston, for Rio October 2, to take the place of the *Essex*, which last-named vessel was also ordered home.

The *Hartford* left Rio de Janeiro October 9, 1878; visited Santos, and reached St. Catharines the 21st; sailed November 15 for Montevideo, where she remained until April 15, 1879, when she left for Buenos Ayres, and arrived at an anchorage off that place the following day. On the 28th, sailed for Colonia, remaining there a week or more, and returned to Montevideo May 6. On the 21st of July, left for Rio de Janeiro, where she arrived August 2; sailed September 29, and arrived at the navy-yard, Boston, November 17.

The *Essex* left Rio de Janeiro September 1, 1878, for Tristan da Cunha, for the rescue of the crew of the American ship *Mabel Clark*, which was wrecked on that island in May, 1878. She arrived there October 10, but finding that all of the crew, who desired, had left for Cape Town and other places (six having perished in the wreck), the *Essex* left the evening of that day and reached Cape Town the 20th; sailed November 2, arrived at the Island of St. Helena the 16th; reached Hotspur Bank December 10, where lines of sounding were run; sailed that afternoon and reached Montevideo the 22d—the cruise having lasted three months. On the 16th of January, 1879, the *Essex* sailed for Port Stanley, Falkland Islands, arriving there the 29th, to inquire concerning the missing American schooner *Charles Shearer*, but was unable to elicit any reliable information. She departed February 5 and reached Montevideo the 17th. On the 10th of April, left to run lines of soundings, &c., in the vicinity of the mouth of the La Plata, and returned on the 20th. In the latter part of July, left for Buenos Ayres, and to complete the survey of the mouth of the La Plata and to search for the *Madeiras Rock*; performed that duty and sailed from Montevideo the 2d of August, arriving at Rio the 13th. On the 26th, left for Philadelphia, Pa., under orders to touch at Bahia, Brazil, on her way, and arrived at the League Island navy-yard October 10. She was put out of commission at that navy-yard the 22d of October.

EUROPEAN STATION.

The naval force on this station is under the command of Rear-Admiral John C. Howell, and consists of the following-named vessels: *Trenton* (flag-ship), 11 guns; *Quinnebaug*, 8 guns; *Wyoming*, 6 guns; *Enterprise*, 6 guns.

Rear-Admiral William E. Le Roy having, at his own request, been relieved, turned over the command of the station temporarily to Capt. John L. Davis, January 23, 1879, and Rear-Admiral Howell assumed command February 5 following.

The *Alliance*, 6 guns, attached to the station for the past three years, left *Ville-Franche* October 16 for Boston, Mass.

The Despatch, which was on special duty at Constantinople, Turkey, left that place March 10, 1879, and after remaining about a month at Genoa, Italy, left there May 8, arriving at Washington, D. C., June 30, and was put out of commission July 9.

The Gettysburg, on special surveying duty in the Mediterranean, having broken down and been condemned, was sold at auction, at Genoa, Italy, May 8, 1879, for \$10,983.46.

The Trenton sailed from Ville-Franche, France, November 20, 1878, reached Spezia, Italy, the next day, and sailed December 4; arrived at Naples, Italy, the 6th, and left on the 28th, and reached Ville-Franche the 30th. On March 10, 1878, arrived at Naples, left the 23d and reached Genoa, Italy, the 25th; remained until April 12, when she sailed for Ville-Franche, arriving there the same day. On the 30th left and reached Genoa the following day; returned to Ville-Franche and left May 18 for Marseilles, France, arriving the same day; reached Barcelona, Spain, June 1, sailed the 3d and arrived at Gibraltar the 6th; left on the 10th, reached Cadiz, Spain, the following day, having also stopped at Tangier, Barbary. On the 14th sailed for Portsmouth, England, arriving there the 24th; thence left for Terneuzen, Holland, reaching there July 4, and Antwerp, Belgium, same date. Sailed on the 15th for Flushing, Holland, arriving there the same date, and leaving on the 23d; on the 26th arrived at Copenhagen, Denmark; sailed August 2 and reached Gravesend, England, the 5th; left there the 28th, and, touching at Isle of Wight, Gibraltar, Port Mahon, arrived at Ville-Franche September 26. Left November 15 for Gibraltar, there to await the arrival of the Constellation, from New York, with relief officers and a new crew.

The Quinnebaug sailed from Norfolk, Va., January 11, 1879, reached Gibraltar February 2 and Ville-Franche the 12th. Sailed March 8, reached Port Mahon, Balearic Isles, the 10th, left the 18th and arrived at Malaga, Spain, the 25th; sailed April 2 and reached Gibraltar the following day; left the 6th, stopped at Tangier and Algiers, arriving at the last-named place the 14th. On the 22d sailed for Tunis and arrived the 24th; left the 28th for Alexandria, Egypt, and sailed May 17 for Jaffa, Syria, which port she reached the 19th; departed thence the 26th, reached Smyrna, Turkey in Asia, June 2, left the 16th, and arrived at Constantinople, Turkey in Europe, the 20th. After a considerable stay there, sailed for Phalerum, Greece, arriving the 31st. On the 4th of August sailed for Trieste, Austria, which place she reached the 9th; left the 20th, arriving at Venice the same day, Naples September 7th, and Ville-Franche the 23d. On the 20th of October sailed for the west coast of Italy and arrived at Leghorn the 21st.

The Wyoming arrived at Ville-Franche, from New York, December 24, 1878; sailed January 14, 1879, for Smyrna, which port she reached the 30th, having stopped at Palermo, Sicily; remained at Smyrna until March 4, when she left for Constantinople; sailed thence the 14th for Alexandria, Egypt, arriving the 18th. On the 3d of April left for Jaffa, reaching there the 8th; sailed the 13th and stopped at Beirut, Syria, same day; departed the 18th and arrived at Piræus, Greece, the 23d; left for Ville-Franche May 1, and sailed from there the 19th for the coast of Italy, visiting Leghorn and Venice, Italy, and Palermo and Messina, Sicily, and Trieste, Austria; left Trieste July 12 and arrived at Phalerum Bay, Greece, the 24th; thence sailed for Constantinople, which port she reached August 5; sailed the 10th, visited many ports in the Black Sea, and returned to Constantinople the 27th; left September 3, arrived at Smyrna the 5th, Tripoli the 12th, Girgenti the 15th, Marsala the 17th,

Cayliari the same day, Palmas the 21st, Barcelona the 24th, Marseilles the 30th, and Ville-Franche the same day. On the 3d of November sailed for Algiers and the north coast of Africa.

The *Enterprise* arrived at Gibraltar December 22, 1878, from New York; left the 31st and reached Ville-Franche January 4, 1879; sailed the 14th, visited Palermo, Palmas Bay, Port Mahon, Barcelona, Toulon, and returned to Ville-Franche the 1st of April. On the 1st of May sailed and visited Havre, France; Antwerp, Wilhelmshaven, Germany; Cuxhaven, Germany; Christiania, Norway; Copenhagen, Denmark; Cronstadt, Russia; Kiel, Germany; Cowes; reaching the last-named place August 13. Sailed September 1, visited Tangiers, Cadiz, Gibraltar, Port Mahon, and returned to Ville-Franche October 1. On the 16th left for Naples, arrived the 20th, and sailed for Messina the 31st.

The *Alliance* arrived at Smyrna October 11, 1878, and remained there until early in February, 1879, when she left for Ville-Franche. Sailed from Ville-Franche March 8, and visited Genoa, Leghorn, Naples, Palermo, Tunis, Malaga, Gibraltar, Tangier, Cadiz, Lisbon, Havre, Southampton, Antwerp, Flushing, Copenhagen, Stockholm, Revel, Spithead, Gibraltar, Alicante, Grao de Valencia, and returned to Ville-Franche September 29. On the 16th of October sailed for Boston, Mass.

PACIFIC COAST.

The force on this station is still under the command of Rear-Admiral C. R. P. Rodgers, and remains the same as stated in the last annual report: *Pensacola* (flag-ship), 22 guns; *Alaska*, 12 guns; *Lackawanna*, 10 guns; *Adams*, 6 guns; and store-ship *Onward*, at Callao, Peru.

The *Pensacola* left the navy-yard, Mare Island, Cal., November 13, 1878; anchored at Mazatlan the 25th; Guaymas, December 3; Pichilingue, the 7th; San Blas, the 14th; Manynillo, the 16th; Acapulco, the 19th. Leaving the Mexican coast, arrived at Champerico, Guatemala, the 25th, and at San José de Guatemala, the 26th; anchored at Acajutla, La Libertad and La Union, in San Salvador; Corinto, in Nicaragua, and Punta Arenas, Costa Rica, arriving at Panama, United States of Colombia, January 9, 1879. Sailed the 25th; reached Talcahuano, Chili, March 4; Valparaiso, Chili, the 12th; Coquimbo, Chili, April 2; Iquique, Peru, the 10th, having also visited Caldera and Autofagasta; left on the 17th, and anchored at Pabellon de Pica the same day; departed the 18th, reaching Huanillos, Peru, that day; returned to Iquique the 19th, and left the next day, arriving at Callao, Peru, the 24th. Sailed June 14; reached Iquique, the 26th, after a cruise along the coast of Peru, having anchored at Pisco, Arica, and Pisco. Left the 28th, and arrived at Callao July 7. On the 16th of August sailed and arrived at Coquimbo, Chili, September 20, having visited on the way the ports of Mollendo, Arica, Iquique, Maxillones de Bolivia, Autofagasta, and Caldera.

The *Lackawanna* sailed from San Francisco, Cal., October 28, 1878, and visited Pichilingue, San Blas, Manynillo, Acapulco, Champerico, San José de Guatemala, Acajutla, La Libertad, La Union, Corinto, Anapala, and Punta Arenas, arriving at Panama January 11, 1879. On the 11th of March sailed for Callao, where she remained until April 30, when she left for the Samoan and Gilbert Islands; arrived at Apia, Samoan Islands, June 25, having stopped two days at the Marquesas Islands. She was at Samoa late in September, from which place she expected to sail, as soon as the condition of affairs would permit, for San Francisco via the Gilbert Group and the Sandwich Islands.

The *Alaska* visited Talcahuana, Valparaiso, Callao, Payti and Lum-

berg, and arrived at Panama November 16, 1878. Sailed January 21, 1879, and visited Punta Arenas, Corinto, Anapala, La Union, La Libertad, Acajutla, San José, Champerico, Acapulco, Manynillo, San Blas, Mazatlan, Guaymas, Pichilique, and arrived at San Francisco March 11. Sailed on the 22d; arrived at Sitka, Alaska Territory, April 3, for the protection of American citizens and interests against the Indians. Left the 12th, and reached Victoria the 18th, from whence, under telegraphic instructions from the department, departed the 22d, and returned to Sitka, arriving there May 1, and remaining until June 16, when she was relieved by the Jamestown. She arrived at San Francisco the 24th, and remained until August 12, when she sailed for Panama, where she arrived September 15. She is now at Callao, or some other point on the Peruvian or Chilian coast.

The Adams arrived at Valparaiso from the Samoan Islands, October 31, 1878, and Callao, December 1; arrived at Panama February 15, 1879, remaining there until May 12, when sailed for Callao; returned to Panama, and left June 12; visited Punta Arenas, La Union, Acapulco, Mazatlan, and La Paz; arrived at San Francisco July 19, and went up to the navy-yard, Mare Island, for repairs.

ASIATIC STATION.

Rear-Admiral Thomas H. Patterson continues in command of this station, and the force now comprises the following-named vessels: Richmond (flag-ship), 14 guns; Monocacy, 6 guns; Ashuelot, 6 guns; Ranger, 4 guns; Alert, 4 guns, and Palos. The Alert returned to the United States February 24, 1879, and having been repaired and refitted at the Mare Island (Cal.) navy-yard, left there August 30, 1879, for Yokohama, Japan, to resume her duties on the station.

The Monongahela and Ranger have been detached, and the former left the station September 27, and arrived at the navy-yard, Mare Island, Cal., October 31; and the latter is under orders to leave October 31.

The Richmond was put in commission at the navy-yard, Boston, November 19, 1878; left there December 28 and arrived in New York the 30th. On the 11th of January, 1879, sailed; reached Gibraltar February 5; Ville-Franche, the 21st; Port Said, March 14; Aden, the 26th; Point de Galle, Ceylon, April 15; Singapore, the 29th; Hong-Kong, China, May 15; Shanghai, China, the 25th; Nagasaki, Japan, June 21, from Tientsin with General Grant and party on board; Yokohama, Japan, July 3. On the 4th of July Rear-Admiral Patterson transferred his flag to her from the Monongahela; October 5 left for Shanghai, Foochow, Amoy, Hong-Kong, and Manila.

The Monongahela arrived at Nagasaki November 9, 1878, from Shanghai, and at Yokohama December 9; at the last named place Rear-Admiral Patterson transferred his flag to her from the Monocacy. Left Yokohama April 13 to search for the Pacific mail steamer Alaska, and returned on the 27th. Sailed from Yokohama August 13; reached Hakodate the 20th; left the 27th and returned to Yokohama the 31st. Left September 27 for the navy-yard, Mare Island, Cal., where she arrived October 31, to be put out of commission.

The Monocacy arrived at Shanghai February 1, from Yokohama, having touched at Kobe and Nagasaki; visited Ningpo and Moon Bay and returned to Shanghai March 8; rendered assistance, in company with the Palos, to the British man-of-war Iron Duke on the occasion of her grounding in the Woosung River. On the 23d of August left Shanghai for Cheefoo.

The *Ashuelot* arrived at Yokohama August 23, 1878; left October 3, and visited Kobe, Nagasaki, Foochow, Amoy, and Hong-Kong; sailed December 2 for Manila; left the 27th for Bangkok, Siam, arriving there January 4, 1879; sailed on the 19th, and visited Saigon, Pak-hoi, and Hong-Kong; left Hong-Kong May 12; departed from Shanghai the 23d, with General Grant and party on board, for Teintsin. On arrival at Tientsin the General and party took passage in the *Richmond*, and the *Ashuelot* arrived at Yokohama July 3 in company with that vessel; left September 27 for Shanghai for repairs.

The *Alert* left Amoy October 22, 1878, to search for the rock, at the south end of Formosa, upon which the American bark *Forest Belle* is alleged to have struck; performed that duty and returned to Yokohama, and on the 4th of January, 1879, sailed for San Francisco, Cal.; arrived at the Mare Island navy-yard February 24; was repaired and refitted, and left there for Yokohama August 30.

The *Ranger* arrived at Nagasaki November 25, 1878, from Canton and Hong-Kong; left December 23 to assist the American ship *Paul Revere*, and towed that ship and anchored her in a safe position; from thence proceeded to Yokohama; left February 11, 1879, for Kobe and Nagasaki; left Nagasaki March 13, reached Amoy the 25th, having visited Foochow; sailed from Amoy April 17, arrived at Formosa the 18th, and the investigation of the burning of the *Forest Belle* was commenced; returned to Amoy the 24th; made a visit to Swatow May 21, and returned to Amoy, thence to Hong Kong; cruised up the China coast, and arrived at Yokohama in August. She is under orders to leave the station about October 31st for San Francisco, Cal.

The *Palos* left Tientsin April 19, reached Cheefoo the 22d, having stopped at Taku, and Shanghai the 25th. On the 23d of August sailed from the last-named port for Cheefoo.

SPECIAL SERVICE.

The *Ticonderoga*, flag-ship of Commodore R. W. Shufeldt, was put in commission at the navy-yard, Portsmouth, N. H., November 5, 1878; reached Norfolk, Va., the 27th, and sailed from Hampton Roads December 7; reached the island of Madeira the 24th, and Porto Grande, Cape Verde Islands, January 7, 1879; arrived at Sierra Leone, West Africa, the 15th, having touched at Porto Praya, St. Jago. The commissioners on the Liberian boundary question met February 12 and adjourned until April, and on the 17th of February the *Ticonderoga* sailed and arrived at Monrovia, Liberia, the 21st; visited the Taboo district below Cape Palmas, and April 1 left Cape Mount, Liberia, for the Sulymah River in order that Commodore Shufeldt might meet the commission there as arbitrator. The commission met on the 6th and concluded its sittings the 24th. The *Ticonderoga* left Sulymah the 25th, stopped at Monrovia, and leaving the 29th anchored off Bonny River, and arrived at the island of Fernando Po May 7; on the 14th sailed for the Gaboon River, reached there the 16th, and on the 18th left for the Congo River; remained there for a short time and arrived at St. Paul de Loando June 3, and the island of St. Helena the 21st; left there July 19 and reached Cape Town, South Africa, August 4. On the 1st of September sailed for Madagascar, intending to visit on the way St. Augustine and Tamatave and St. Mary Island, east coast of Africa; thence to Nos Beh on the north coast; and thence to Zanzibar, expecting to arrive at the last named place between the 1st and 15th of October. Arrived at Aden, Arabia, November 24

from Zanzibar, and expected to leave the 29th for Muscat, Persian Gulf, and Bombay.

The *Jeanette* having been, under the acts of Congress of March 18, 1878, and February 27, 1879, accepted from James Gordon Bennett, was fitted out, officered, and manned, and left San Francisco, Cal., July 8, 1879, on her voyage toward the North Pole, by way of Behring's Straits, and at last advices was at St. Lawrence Bay, Siberia.

The *Jamestown*, formerly used, under the act of Congress of June 20, 1874, by the State of California as a marine school-ship, was returned to the Navy March 3, 1879, and was repaired and refitted at the Mare Island navy-yard. She sailed from San Francisco May 22, 1879, for Sitka, Territory of Alaska, where she arrived June 14, and where she remains for the protection of American citizens and interests.

The *Constitution* left Havre, France, January 12, 1879, for New York with articles from the Paris Exposition. Having ran ashore at Swanage Bay, English Channel, and afterward having had her rudder injured at sea on her way to New York, she was detained at Portsmouth, England, and Lisbon, Portugal, for repairs, and did not reach New York until May 24; left there the 31st, arrived at the League Island, Pa., navy-yard June 3, and returned to New York July 24. (See Training ships.)

The *Constellation* was ordered to the navy-yard, New York, on return from practice-cruise with cadet-midshipmen, was put in commission October 13, 1879, and left November 10 for Gibraltar with stores for the European station and a new crew for the flag-ship *Trenton*. She will bring back to New York the officers and crew of the *Trenton* to be relieved.

The *Portsmouth* arrived at the navy-yard, New York, December 20, 1878, from Havre, France, with articles from the Paris Exposition. (See Training-ships.)

The *Supply* left Havre, France, January 2, 1879, with articles from the Paris Exposition; arrived at the navy-yard, New York, March 26, and was put out of commission April 23. She has since been towed around to League Island, and is under repair.

TRAINING-SHIPS.

The following-named vessels are now employed as training-ships for apprentice boys in the Navy: *Minnesota*, *Constitution*, *Portsmouth*, and *Saratoga*.

The *Wachusett* was employed for a short time enlisting boys at New Orleans, La., and Vicksburg, Miss., and the *Michigan* has been employed on similar service at the principal ports on the lakes.

The *Minnesota* left New York July 7 on a cruise up the Hudson River; visited Newburgh, Poughkeepsie, Stony Point, and Rondout, returning to New York the 30th. On August 30 sailed and reached Newport, R. I., September 2; left the 25th, and arrived at Hampton Roads, Va., on the 27th. After the review at Hampton Roads October 14, she proceeded to New York, and will winter at New London.

The *Constitution* left the navy-yard, New York, the 7th of October, 1879, and arrived at Hampton Roads the 11th. She is now under orders for a cruise in the Gulf and the Caribbean Sea, and will touch at Aspinwall.

The *Portsmouth* left the navy-yard, New York, January 2, 1879; reached Hampton Roads the 12th, and went to the Norfolk navy-yard the 21st; anchored in the Roads April 21; arrived at Port Royal May 24; returned to Hampton Roads June 1; sailed the next day and reached

New York the 4th; left the 12th, and visited Gardner's Bay, New London, Conn.; Newport, R. I.; Boston, Mass.; Portsmouth, N. H.; Portland, Me.; Mount Desert, Me.; Halifax, Nova Scotia, reaching the last-named place September 2; left there the 9th, and arrived at Hampton Roads the 20th; sailed and arrived at the navy-yard, Washington, November 14.

The *Saratoga* arrived at Hampton Roads, Virginia, March 8, 1879, from Washington. On the 3d of April sailed; arrived at the island of Fayal the 17th, and the island of Madeira May 22; sailed the 31st, inspected the port of Naos, Lanzasote, and arrived at Santa Cruz, Tenerife (Canary Islands), June 3; left the 11th; reached Bermuda Islands the 25th; sailed July 2 and arrived at New York the 8th, New London, Conn., the 19th, New Bedford, Mass., August 5, and Hampton Roads the 20th of September; sailed and arrived at the navy-yard, Washington, November 19.

SURVEYING DUTY, ETC.

The *Tuscarora*, surveying the West Mexican coast, left Salinas Cruz, Mexico, December 31, 1878; arrived at San José de Guatemala January 3, 1879, La Union, San Salvador, the 6th, Panama, United States of Colombia, the 13th; left there the 23d and reached Acapulco, Mexico, February 14; sailed March 7; arrived at Salinas Cruz the 15th, Acapulco April 14, Pichilingue, Lower California, June 14, and the navy-yard, Mare Island, California, the 30th. Having been repaired there, sailed September 25 to resume her surveys.

The *Constellation* has made her annual cruise with the cadet-midshipmen, and the *Mayflower* and *Standish* with the cadet-engineers.

The *Wachusett* was put in commission at the navy-yard, Boston, May 26, 1879, and left there June 5; arrived at the navy-yard, Pensacola, Fla., the 17th, and at New Orleans, La., the 23d; went up the Mississippi River to Vicksburg to enlist apprentice boys in the Navy, but, on account of the low state of the water, returned to New Orleans July 14; left there the 29th; arrived at Key West, Fla., August 8; departed the 10th, and arrived at New York the 19th and Boston the 23d. (See South Atlantic Station.)

The *Michigan* left Erie, Pa., July 21, 1879, to enlist apprentice boys in the Navy and visited the following-named ports on the lakes: Chicago, Milwaukee, Sheboygan, Green Bay, Port Huron, Detroit, Toledo, and Cleveland, and returned to Erie October 10.

The *St. Mary's* continues in use by the State of New York, under the act of June 20, 1874, as a marine school ship.

The *Tallapoosa* has made regular trips to the navy-yards with freight.

The torpedo vessels, *Intrepid* and *Alarm*, are at the navy-yard, New York; the last named left Washington June 6, 1879, and arrived at New York the 10th for the purpose of having the Mallory steering-wheel applied to her. She is about ready for trial.

The *Speedwell* was put in commission July 1, 1879, at the navy-yard, Washington, for duty under the United States Commissioner of Fish and Fisheries. On the completion of this duty she returned to Washington October 12, and was put out of commission the 24th.

The *Rio Bravo* continues on duty on the Rio Grande, Texas.

APPENDIX.

No. 1.—ESTIMATES, SECRETARY'S OFFICE.

Estimates of appropriations required for the service of the fiscal year ending June 30, 1881, by the Navy Department.

Detailed objects of expenditure, and explanations.	Estimated amount which will be required for each detailed object of expenditure.	Amount appropriated for the current fiscal year ending June 30, 1880.
SALARIES.		
Secretary of the Navy, per act June 21, 1879.....	\$8,000 00	
Chief clerk, per act June 21, 1879	2,500 00	
Disbursing clerk, per act June 21, 1879	2,000 00	
Four clerks of class four, per act June 21, 1879	7,200 00	
Two clerks of class three, per act June 21, 1879	3,200 00	
One stenographer, per act June 21, 1879	1,600 00	
One clerk of class two, per act June 21, 1879	1,400 00	
Four clerks of class one, per act June 21, 1879	4,800 00	
Three clerks, at \$1,000 each, per act June 21, 1879	3,000 00	
Two messengers, at \$840 each, per act June 21, 1879	1,680 00	
Two laborers, at \$680 each, per act June 21, 1879.....	1,320 00	
	36,700 00	\$36,700 00
CONTINGENT.		
Stationery, furniture, newspapers, and miscellaneous items, per act June 21, 1879.....	10,000 00	2,500 00
SALARIES, BUILDING.		
Superintendent, per act June 21, 1879	250 00	
One engineer, per act June 21, 1879	1,200 00	
One assistant engineer, per act June 21, 1879	1,000 00	
One conductor of elevator, per act June 21, 1879	720 00	
Three firemen, at \$720 each, per act June 21, 1879	2,160 00	
One fireman, at \$720 (submitted)	720 00	
Nine watchmen, at \$720 each, per act June 21, 1879	6,480 00	
Four laborers, at \$660 each, per act June 21, 1879	2,640 00	
Eight charwomen, at \$180 each, per act June 21, 1879	1,440 00	
Six charwomen, at \$180 each (submitted)	1,080 00	
	17,690 00	15,890 00
CONTINGENT.		
Incidental labor, fuel, light, and miscellaneous items, per act June 21, 1879	10,000 00	7,000 00
PAY OF THE NAVY.		
Officers on sea duty, officers on shore or other duty, officers on waiting orders, officers on retired list, secretaries, clerks, extra pay to enlisted men, officers in excess of present list, and changes of duty, &c.; pay of petty officers, seamen, ordinary seamen, landsmen and boys, including men in the engineer force; and for the Coast Survey service, 7,500 men, and 750 boys, at the pay prescribed by law (R. S., p. 265, sec. 1556; p. 269, sec. 1569; p. 272, sec. 1595; per act February 14, 1879, (20 Stat. L., p. 284, sec. 1; per act May 12, 1879, 21 Stat. L., p. 3, sec. 1)	7,271,725 00	
For exchange, mileage, and transportation of funds	275,000 00	
	7,546,725 00	7,243,275 00
<p>NOTE.—The estimate for the above purpose for the current fiscal year was \$2,400,000, being for 7,500 men, at an average pay of \$320 per man, although but \$2,300,000 was appropriated. The estimated for the next fiscal year is increased \$90,000, being for pay of 750 boys authorized to be enlisted by act of May 12, 1879.</p>		
POSTAGE.		
Official postage-stamps for the Secretary's office and the bureaus of the Navy Department (appropriated)	20,000 00	20,000 00

Estimates of appropriations required for the service, &c.—Continued.

Detailed objects of expenditure, and explanations.	Estimated amount which will be required for each detailed object of expenditure.	Amount appropriated for the current fiscal year ending June 30, 1890.
PRINTING AND BINDING.		
Printing and binding for the Navy Department, to be executed under the direction of the Public Printer (appropriated)	\$53,000 00	
CONTINGENT, NAVY.		
Rent and furniture of buildings and offices not in navy-yards; expenses of courts-martial and courts of inquiry, boards of investigation, examining boards, with clerks' and witness' fees, and traveling expenses and costs; stationery and recording; expenses of purchasing-paymasters' offices at various cities, including clerks, furniture, fuel, stationery, and incidental expenses; newspapers and advertising; foreign postage; telegraphing, foreign and domestic; copying; mail and express wagons, and livery and express fees, and freight; all books for the use of the Navy; care of library; experts' fees and costs of suits; commissions, warrants, diplomas, and discharges; relief of vessels in distress and pilotage; recovery of valuables from shipwrecks; quarantine expenses; care and transportation of the dead; reports, professional investigation, and information from abroad; and all other emergencies and extraordinary expenses, arising at home or abroad, but impossible to be anticipated or classified, per act June 21, 1879.....	80,000 00	\$80,000 00

No. 2.—NAVAL ACADEMY.**REPORT OF SUPERINTENDENT.**

UNITED STATES NAVAL ACADEMY,
Annapolis, Md., October 22, 1879.

SIR: I have the honor to report that, in obedience to the orders of the department, I assumed the command of this institution on the 2d August last.

The academic year had closed, the cadets had been embarked on the practice vessels and sailed on their summer's cruise, and the professors and others of the academic staff, &c., had been granted their usual leave of absence.

After making myself as familiar with the Academy as the limited time would permit, I proceeded to Newport, R. I., and on the 25th August hoisted my flag on the Constellation and immediately proceeded to sea, in order that I might have an opportunity of witnessing the working of the ship by the cadets, and the mode of instruction imparted to them aboard ship, &c., all of which was entirely satisfactory to me.

The Constellation arrived at the Academy on the 29th August, and the practice steamers Mayflower and Standish the next day, when the cadets were disembarked, and all whose good conduct merited it were granted one month's leave of absence.

The examination of candidates for appointment as cadet-engineers commenced September 15. One hundred and seventy-seven reported for examination; 18 were found physically disqualified for the service, and 159 were subjected to competitive examination, and a report of the same forwarded to the department; when, in conformity with the law, the first 25, viz, those who passed highest in order of general merit, were appointed cadet-engineers and received into the Academy.

The examination of candidates for admission as cadet-midshipmen commenced September 22. Fifty-two have reported for examination; 2 were found physically disqualified for the service; 1 declined to submit to the physical examination; 16 failed to pass the mental examination, and 33 were found duly qualified for admission and received into the Academy; making 253 cadet-midshipmen and 99 cadet-engineers; total, 352 cadets now in the institution.

The estimates for the support of this institution for the fiscal year ending June 30, 1881, were transmitted to you on the 13th instant.

The report of Commander F. V. McNair, U. S. N., of the practice cruise of the *Constellation* and accompanying copies of papers, and of the reports of the instruction of the cadet-midshipmen in professional branches; and also of Lieut. Commander W. M. Folger, U. S. N., of the report of the cruise of the practice steamers *Mayflower* and *Standish*, together with the reports of the instruction of the cadet-engineers in professional branches meet my hearty approval, and are transmitted herewith for the information of the department.

I am, sir, very respectfully, your obedient servant,
 GEO. B. BALCH,
Rear-Admiral, Superintendent.

Hon. R. W. THOMPSON,
Secretary of the Navy, Washington, D. C.

REPORT OF THE BOARD OF VISITORS.

UNITED STATES NAVAL ACADEMY,
Annapolis, Md., June 10, 1879.

SIR: The Board of Visitors appointed to attend the annual examinations at the United States Naval Academy have the honor to submit the following report of their proceedings:

The Board met on the 2d instant and organized as follows: Commodore T. H. Stevens, president; Hon. M. J. Durham, vice-president; and Lieut. R. C. Derby, secretary.

The usual committees were appointed by the chairman, and at least one session held daily from June 2 to 10, inclusive.

The Board desire to express their pleasure at the promptness with which the Acting Superintendent and the officers and professors connected with the Academy have responded to their requests for information to facilitate their labors.

SEAMANSHIP, GUNNERY, AND NAVIGATION.

Seamanship.—The examinations afford evidence of careful and skillful instruction in the theory of this most important element of naval education.

The exercises on board the sloop-of-war *Dale*, under way, in which the ship was handled and all the incidental duties of seamen performed by cadet-midshipmen, with the spar exercise, sending down royal, top-gallant, and top sail yards, housing top-masts, and striking lower yards, in part, were very satisfactory, affording a striking illustration of the advantages which attend practice.

In the theory of gunnery, the instruction is sufficient as it is; also in practice, so far as the means of the Academy permit. It is recommended that a steam-vessel of 500 or 700 tons be stationed at the Academy for gunnery practice. At present the instructors are limited to the Santee, which is for this purpose as immovable as the dry land, and the monitor, which, though most valuable as a special type of vessel, is so slow that firing from her is practically firing from a stationary platform. Such a vessel as indicated would be able to maneuver round a target. With a light battery of rifled and smooth-bore ordnance, the expense of practice would be no greater than at present, while the eye would receive that education in following a shifting target which is so essential at sea. Such a vessel would afford special advantages for practical exercise with the steam-engine and the handling of a steam-vessel, as well as for practice cruises at sea.

The system of instruction in theoretical navigation, with practical work at the Academy and on the practice cruises, affords all that is required to prepare an officer to navigate a ship or to make hydrographic surveys.

STEAM.

The department of steam engineering is found to be admirably conducted and in a very efficient condition, the instructions given in its theoretical branches being thorough. The practical instructions are also thorough and excellent, as far as the facilities for the same will permit.

The designing of marine-engines, screw-propellers, boilers, and various kinds of machinery, both general and in detail, involving as it does an extensive knowledge of descriptive geometry, is very efficiently taught; and the instruction of the use and manipulation of the several organs of machinery and generators, and the application of steam to useful purposes, is performed in the most complete manner by means of proper apparatus; besides which, the practical operation of working marine-engines, firing and feeding boilers, is efficiently done on board the monitor Nantucket afloat; also, by operating, connecting, and disconnecting the parts of the marine-engine erected on shore, thus leaving but little improvement to be desired in this direction. In order, however, that the education of the cadet-engineer may be more extended and thorough in not only a knowledge of the theory, the designing, and the varieties of metals employed, but also in a knowledge of the best methods of manufacturing the best materials, and practically executing with tools all work entering into an iron ship of war and the machinery for it, we recommend that the tools and facilities be increased, which shall include appliances for iron boat-building, and for laying down the lines of vessels and designing the detailed parts of the same. This may be inaugurated in an economical way by building small cutters and boats for the Navy, including the machinery to accommodate the necessary additional appliances. The enlargement of the building has been recommended by this and the last Board.

MATHEMATICS AND MECHANICS.

The instruction in mathematics and mechanics is given with manifest thoroughness and enthusiasm, by means of elective branches which the most proficient can procure. It is conducted also in a manner adapted

to invite the most thorough efforts of which the student is capable. The minimum of attainment which he is required to reach in order to retain his place seems to the Board remarkably high; but yet he is securely guarded from injustice by a singularly fair and generous application of the rules for determining his standing. The great importance of this branch of study in its application to the arts of navigation in all their bearings seems to be duly appreciated by the instructors, and that application is demonstrated in the course of instruction with commendable clearness and precision. The whole ordering of this department seems so little open to criticism, that the Board have no especial suggestions to offer.

PHYSICS.

The course of instruction in physics is as extended as the time allotted permits. The apparatus has been selected with care and judgment, and is in good condition. In view of the importance of this branch, it is recommended that the appliances for purposes of illustration and investigation be made complete as possible, by continued additions of carefully selected apparatus by the best makers.

ENGLISH STUDIES AND MODERN LANGUAGES.

The examinations in these departments being chiefly written, the Board have carefully criticised the examination papers which have been submitted to their inspection, and have also attended the oral examinations. The system of instruction in French and Spanish is both comprehensive and thorough, and the progress made by the different classes evinces the fidelity of the instructors, together with their admirable method, and also the conscientious labor of the cadets. The officers of the United States Navy who receive this thorough instruction are competent to conduct negotiations through the medium of these languages, and to represent their government at all ceremonies where these tongues are spoken.

The department of English studies opens a somewhat wider field for the investigation of the Board. Their first observation is, that the standard of acquirements as a condition precedent to an admission to the Naval Academy imposes upon the accomplished corps of instructors duties which may quite as well be performed by the teachers in the common schools throughout the land. It would seem that instruction in spelling, in the rudiments of English grammar, and in punctuation ought not to be required of officers who are subsequently to teach the higher branches of history, international law, and the Constitution of the United States. As a consequence of this low standard for admission, much valuable time is consumed in purely elementary instruction at the expense of the government, and a needlessly large proportion of cadets fail to sustain themselves in competition with those who start upon their academic course with a sufficient knowledge of these essential prerequisites. Aside from the serious disappointment to young men who thus fail to pass their examination, the effect upon their subsequent career is much to be deprecated.

The Board are far from advising such a change in the standard for admission as would exclude from the Academy all save those who are thoroughly instructed in every branch of preparatory study; but they are decided in the opinion, that the best interests of the service and the

truest economy to the nation demand that the present standard for admission should be materially raised, so that the highest efficiency of the service may be secured, not only through the character but by the exact scholarship and the thorough scientific training of its officers.

The principle of competitive examinations before admission has already been applied to the cadet-engineers. The Board can see no reason why this system should not be extended to the appointment of cadet-midshipmen by members of Congress, and they are of opinion that it would exclude from the Naval Academy many candidates for admission whose acquirements and natural qualifications unfit them for its privileges. Passing from this subject, the Board remark that the tendency of an exclusive or purely professional education is apt to be a contracting one, and hence the importance of those studies which, while indispensable to an education for a particular profession, are broadening in their influence upon the character and intellect and tend to the highest development of an educated man. Of this class are the studies known in the academic course as "English studies," and embracing (besides those which the Board consider as being properly preliminary) rhetoric and the practice of composition; history, both European and American; the Constitution of the United States and international law, together with the examination of those general principles which control the complex relations of individuals and of nations. The importance of these studies to the officers of the United States Navy cannot be overrated; they fit them for association with the best trained minds with which they may come in contact; they render easy the subsequent acquirement of knowledge; they impart dignity, precision, and grace to their literary work, and they fit them for the sound decision of those complicated questions upon which may depend the issues of peace or war.

The Board have carefully investigated the methods of instruction in the department, and they cannot too highly commend them. The proficiency of the cadets is also gratifying. The Board earnestly recommend the enlargement of the course of instruction in English studies by the addition of moral and intellectual philosophy, political economy, and especially of the law of courts-martial. More work should not be required of young men already heavily burdened, but the elimination from the course of purely elementary studies will admit of the introduction of the higher branches.

The Board also think that additional interest would be imparted to the graduation exercises if essays upon professional subjects should be read or delivered by the most distinguished members of the graduating class. The introduction of this system would operate as an incentive to the cadets to perfect themselves in composition and elocution, and would continue throughout their academic course the principle of competition which has proved in other institutions of learning of most enduring value.

GROUND, PUBLIC BUILDINGS, AND SANITARY CONDITIONS.

The Board find that the grounds of the Academy are in a highly commendable condition, and also that the various quarters and buildings are in good order, and, with some exceptions hereinafter mentioned, well adapted to their several uses, and that the sanitary condition of the institution is all that could be desired.

The exceptions to which the Board desire to refer are :

First. The building used for the cadet-quarters is not commensurate with the requirements of the Academy, and the division of quarters, as now existing, necessitates an increased amount of guards and expense, and lessens the efficiency of discipline: The Board, therefore, strongly recommend the addition of a wing to the rear of the new building, in order that the entire body of cadets may be domiciled under one roof.

Second. The Board would especially urge that the laundries now occupying the basement, or lower story, of the cadet-quarters, which is inadequate for the purpose, and also for sanitary reasons, be immediately removed into a separate building to be erected for that purpose.

Third. The Board cannot too strongly recommend the erection of an armory, the building now used for that purpose being in their judgment a discredit to the government. It is an old wooden shed, now supported by outside braces to prevent it being blown over by the first heavy storm.

Fourth. The wooden building and the old hulk now used for the marine barracks is not only unsafe and unsightly, but is inadequate for the proper protection and comfort of the men, and should be immediately replaced by a proper building to be erected for their use.

Fifth. The Board finds that there exists such an urgent want of increased accommodation for necessary additional tools and facilities for the practical work required of the cadets studying in the engineering branch, that they beg to repeat the earnest recommendation of the Board of 1878 for the enlargement of the steam-building.

Sixth. The messroom for officers in the old quarters is uninviting and unattractive. The Board therefore recommend that this and the adjacent reception-rooms be refurnished and repainted.

The Board are well aware that these additions to the Academy will entail a large expenditure, requiring the action of Congress; and they earnestly recommend such legislation as will fully carry out the important alterations and improvements herein suggested.

The Board, being informed that the regulations of the Naval Academy prohibiting the use of tobacco as a wise sanitary provision is not now enforced, would most respectfully recommend that its strict enforcement be at once restored, as in their judgment the regulations against its use in any form cannot be too stringent.

FINANCE AND LIBRARY.

The Board have examined the books of the first aid to the Superintendent, and also the books of the treasurer, and find that the orders drawn by the former and the payments made by the latter correspond to a cent.

They also find that these officers have been governed by the law in making the expenditures, and the amounts appropriated will be sufficient for the remainder of the fiscal year for the various objects as set out in the appropriations.

They have also examined the manner in which the commissary keeps his accounts. They seem to be plain, simple, and correct, and easily understood. The store seems to be kept in a business-like manner, and those in charge have, no doubt, kept an accurate account of the purchases of the cadets, and have charged them very reasonable prices for the articles. We are gratified in saying the whole financial department seems to be well conducted.

We have also looked into and examined the library. We are pleased to see the officers of the Academy taking such a lively interest in a good library. The present library is a very good one, and is in excellent condition. It contains many rare and valuable works, and while Congress has been making a reasonably good annual appropriation for its general increase, yet in consideration of the fact that the officers and cadets must necessarily be conversant with all the recent scientific works in this department, and as these are very expensive, the present appropriation is hardly adequate to purchase the necessary books; and we therefore recommend that the appropriations for books for the library be increased \$500, making it \$2,500 instead of \$2,000. The librarian should have ample means to purchase all the useful and scientific works connected with this important branch of the public service.

ADMINISTRATION AND POLICE.



The Board have examined into the general conduct and management of the institution, the discipline of the cadets, and the police regulations of the grounds, with much care. Some of the rules and regulations would seem to be harsh and unnecessary; yet, when we consider the large number now in attendance, and that irregularities on the part of a few must necessarily produce more or less confusion on the part of all, the discipline must be rigid and strictly enforced. We find that, as a general thing, the cadets observe the rules and regulations of the institution with the same alacrity and delight as they would have those do in after life who may be placed under them in their respective commands. We therefore have no change to recommend.

MISCELLANEOUS.

Inasmuch as the academic course prescribed for the cadet-midshipmen is by statute six years, the two years during which they are on board ships of war in commission prior to graduation are presumed to be included in the academic course, in order that they may attain that proficiency in the profession which can be acquired only in the actual application of theoretical knowledge. It is therefore eminently proper that the attention of commanding officers, to whose fostering care the cadets are committed, should be called to the great importance of affording them ample opportunities of so applying their theoretical knowledge in navigating and in working ship, as well as in performing such other duties as may tend to promote their familiarity with actual seamanship; for upon their skill will depend the efficiency of our Navy of the future.

For the better instruction of the cadets in iron-ship building, we would respectfully recommend that models of the bow and stern frames and midship sections of the different systems in iron or steel be furnished the department of seamanship, as it is only by illustrations of this kind that accurate knowledge can be conveyed of the different frames and fastenings. The department has now models in wood, by which instruction in that branch is greatly facilitated and simplified.

The Board recommend that the vessels known as the Essex class of vessels shall, upon their return from sea, be sent to the Naval Academy to be overhauled and refitted in everything pertaining to their machinery, engines, and boilers by the cadet-engineers. We think that this

would be a saving to the government, and that it would greatly promote the knowledge of practical steam-engineering among the cadets.

The Board recommend that transoms be cut over all the doors of the board-house, and that the balconies be extended the entire front of the building.

The Board recommend that the heads of departments of modern languages and of drawing should, by appropriate legislation, be given permanent positions in the Navy. The Board consider that their duties are of the utmost importance, and that they have been discharged with skill and fidelity; and therefore earnestly recommend that their status be a permanent one, and that special chairs be established by legislation for this purpose.

The Board cannot conclude this report without expressing its profound sympathy for the family of the late Superintendent, Commodore Foxhall A. Parker, whose long and serious illness has for many months deprived his country and the Naval Academy of the services of one of its ablest and most accomplished officers, who died on the last day of the session of this Board.

The Board further desires to express its high appreciation of the ability and zeal displayed by the Acting Superintendent, Commander F. V. McNair, under whose wise and judicious management they find the Naval Academy in a thoroughly satisfactory condition.

T. H. STEVENS,
(Commodore, U. S. N.,) *President.*
M. J. DURHAM,
Vice President, Danville, Ky.
J. W. KING,
Chief Engineer, U. S. N.
JAS. GRANT WILSON,
New York City.
ELI H. MURRAY,
Louisville, Ky.
WM. GODDARD,
Providence, R. I.
JOHN M. BROOKE,
Lexington, Va.
W. R. MYERS,
Anderson, Ind.
E. BUSHNELL,
Fremont, Ohio.
H. B. ANTHONY,
Providence, R. I.
J. R. MCPHERSON,
Jersey City, N. J.

Hon. R. W. THOMPSON,
Secretary of the Navy.

PRACTICE CRUISE OF THE CONSTELLATION.

UNITED STATES SHIP CONSTELLATION,
Annapolis, Md., September 1, 1879.

SIR: I have the honor to submit for your information the following report of the practice cruise of the Constellation, under my command, for the summer of 1879.

The ship was put in commission at Annapolis on May 13, or about one month before the cadets were embarked. This was done at my earnest request, that the ship's company proper might be, to some extent, in a state of discipline before receiving the cadets and proceeding to sea.

On June 10 the diplomas were given to the graduating class, and on the following day 62 cadet-midshipmen of the first class, 6 of the second class, and 52 of the third class, were embarked on this vessel. These cadets of the second class, owing to various reasons, had failed to make the practice cruise last year with their class, hence the reason of their presence.

The ship was detained at Annapolis during the 12th of June in order that the cadets might take part in the funeral ceremonies of the late Superintendent, Commodore Parker, but at daylight of the 13th of June the ship was towed over the bar and anchored in the Annapolis Roads, where she lay until the 18th of June, when she sailed for Hampton Roads, reaching that place June 20.

Being obliged to perform the duties of the Superintendent in addition to my regular duties, I was not able to leave the Academy until June 23, on which date I left for Hampton Roads in the Phlox, arriving on board June 24. At daylight on June 25, it being calm, and wishing to get to sea without further delay, I caused the Phlox to tow the Constellation clear of Cape Henry.

This is the only occasion, except when going over the Annapolis Bar, that any assistance has been permitted from tugs.

On July 1 arrived at Halifax. During the passage the cadets had opportunities of learning how to manage a ship in a thick fog, also the experience of working ship to windward going into Halifax (a portion of the channel being quite narrow).

At Halifax I was courteously received and entertained by Vice-Admiral Sir E. A. Inglefield, commander-in-chief of Her Majesty's North American squadron, and the officers of his command, who, together with the British army officers, were very cordial, extending to myself and officers many civilities. On the invitation of the commander of Her Majesty's ship Bellerophon, the cadets visited that ship in two parties, and were shown all parts of that splendid specimen of naval architecture, in magnificent order. Although pressed by the kind hospitality of the people to make a longer stay, I left Halifax on the 5th of July, worked ship to windward for two days to Cape Sable, and arrived at southwest harbor of Mount Desert on the 8th of July, remaining there until next morning, July 9, then getting under way and arriving at Bar Harbor the same evening, beating to windward the whole distance, being confined to very short tacks, as there are no charts of the eastern side of the passage way. Granting the cadets liberty, &c., I remained at Bar Harbor until the 13th of July, on which date the Constellation sailed for Portland, Me.

During this passage I was obliged to beat out the harbor and down the coast. When off Seguin Point, during thick and squally weather, the cadets had opportunity to see the management of a ship by the wind

during the squalls. Owing to the character of the entrance to Portland Harbor, and the weather being so thick and squally as to shut in the lights, I anchored the ship at 2 a. m. of the 15th of July; got underway at daylight and anchored in Portland Harbor shortly afterwards, exchanging numbers with the Powhatan carrying the flag of Rear-Admiral Wyman.

As the Constellation was anchored about three-quarters of a mile outside the Powhatan, and as Admiral Wyman intimated he thought I ought to be more neighborly, I got underway on July 16, and worked ship against tide and wind, and anchored above the Powhatan. Admiral Wyman visited my command, and was pleased to write a complimentary letter to the department, causing me to receive from the honorable Secretary of the Navy a letter very gratifying to myself and the officers under my command. Copies of these letters, marked respectively A and B, are herewith inclosed.

The citizens of Portland were very hospitable, making our stay at that port so pleasant that the officers and cadets were loth to leave. A ball was given by the citizens in the City Hall to the officers and cadets of the Powhatan and Constellation, and which was largely attended by the cadets.

On the 22d of July the Constellation got under way and worked to windward out of Portland Harbor, having been obliged to anchor three times, owing to the failure of the wind, &c. Once, when close to danger, the ship missed stays, with doubtful room to anchor, and was boxhailed clear of the rocks. Finally I got clear of the harbor by making a half-board to clear buoy No. 2, south end of Bang's Island, and anchored between that and Ram Island, owing to strong tide and light airs.

On the 28th of July I again got under way and entered Casco Bay, through Hussey's Sound. On July 24 I left Casco Bay and proceeded to the Isle of Shoals, when, in endeavoring to anchor off Hog Island, both lower cables parted; ran through between Lunging and Star Islands, bent sheet cables and anchored off Hampton Beach. A copy of a report of a board of officers regarding this affair is inclosed and marked C.

On the 25th of July I shifted anchorage to the Isle of Shoals, and remained there searching for the anchors until the 28th July, when ship was worked and anchored in the evening off Rye Beach. On the 29th sailed down the coast in a thick fog, rounded Cape Ann, and anchored for the night just outside the Boston light. July 30, got under way, and while passing through the narrows on the way to Boston in charge of pilot the ship grounded at low water, but came off easily as the tide rose without other assistance than her sails and kedge, and anchored off Boston shortly afterwards. A copy of my letter to the department, reporting the grounding of the vessel, is inclosed and marked D. The cadets visited the Boston navy-yard, in charge of their instructors, &c.

On the 2d of August the Constellation sailed from Boston for New York, arriving on August 6. During this passage the ship was navigated around the Nantucket Shoals in a thick fog, with adverse winds. The ship was anchored for a few hours, and the tide running about three knots per hour across the shoals, and thus the cadets were shown the danger of the navigation in this vicinity. When the fog lifted, the ship was about five miles south of the Nantucket light-ship.

On the 7th of August the cadets of the first-class were transferred to the tugs Mayflower and Standish, and the cadet-engineers to the Constellation. On the same date the tugs left Newport on a tour of inspection of the arm factories at Hartford, Springfield, Bridgeport, &c., and

returned on the 12th of August, when the cadet-midshipmen and cadet-engineers were re-transferred to their respective vessels. A copy of my order to Lieutenant-Commander Folger, marked E, and a report of his operations, marked F, are herewith inclosed. On the afternoon of August 12, I got under way and anchored off Bristol, R. I. The same evening the officers and two of the cadets made a short visit to Mr. Hevreshoff's establishment. On the 13th of August, got under way and worked to windward, anchoring at night to the southward of Prudence Island. On the 14th of August worked to windward and anchored off Newport. On August 15 ran outside of Newport and worked ship all day off Brenton's Reef light-ship, anchoring at Newport on the same evening. August 16, the cadets of the first class visited the torpedo station.

August 18, sailed from Newport for Gardiner's Island; encountered a very heavy gale off the eastern entrance to Long Island Sound, followed by strong westerly wind. I bore away and anchored off New Bedford, Buzzard's Bay, on the 19th of August. A copy of meteorological notes and observations on the gale are herewith inclosed, marked G. On the 20th, 21st, and 22d of August exercised in various maneuvers, for the instruction of the cadets. On the morning of the 23d of August, got under way from Hen and Chickens light-ship, and anchored off Newport on the same date.

On August 25, Rear-Admiral George B. Balch, Superintendent of the Naval Academy, was received on board and his flag hoisted. On the same date, the *Constellation* sailed for Annapolis, Md., where she anchored off the Naval Academy on the 29th of August. On the 30th of August the cadets were disembarked and granted one month leave of absence to visit their homes.

During the whole cruise the cadets of the first class have been detailed as officers of the deck (day and night) and made to perform all the duties incident to subordinate officers common to a cruising ship. It is believed that they have already acquired some confidence in themselves in directing men and working ship. Every member of the first class has tacked ship at least once, and some few many times, as falling to them while in charge of the deck. Boxhauling, wearing short around, wearing in a light breeze, and wearing in a fresh breeze and gale of wind have been practiced. They have also been thoroughly instructed in practical navigation, as follows:

The use, reading, and adjustment of the sextant; how to read the barometer, and how to take bearings with the azimuth compass; time sights, azimuths and amplitudes; compass error, variation and deviation, and how to find the latter from observations, and the construction of a deviation table; how to find the latitude by meridian altitudes and other methods (circummeridian "versin," "nearnoon," and $k \phi$ methods); time sight of moon and stars; how to wind and compare chronometers; what is meant by "correction" and "rate," and how to find the same from equal altitudes worked as time-sights; how to find the hour angle of a body in the horizon, and on the prime vertical, and the construction of a sunset table; Samner's method of finding single and double lines of position, and the true position by interpolation, using equations $y = mx$, $y = mx \times b$. The construction and use of the Mercator chart, and everything pertaining to dead reckoning.

They have been required to keep note-books containing descriptions of what they saw on board the *Bellerophon*, at the Boston yard, during their cruise on board the tugs, and at the torpedo station, as well as of anything out of the ordinary run on board ships.

They have also been required to write descriptions of boxhauling, wearing short around, and other maneuvers practiced by ships under sail.

The cadets of the third class have been instructed in heaving the lead, knotting and splicing, steering, &c., and have also been required to keep seaman ships' note-books containing drawings and descriptions of the spars, &c., of a ship, of the running and standing rigging, and notes on their visits to the Bellerophon and the Boston yard.

All the cadets were regularly stationed according to the station bills of the Bureau of Equipment and Recruiting, each first-class man having been put in a seaman's number, and each third-class man in an ordinary seaman's number, and, except washing decks or hoisting in stores, they have performed all the duties of blue-jackets, even to voluntarily tying a cable and doing it well.

The conduct of the cadets has been good, and their health excellent.

It will be observed that the character of this cruise is somewhat different from those of recent years. Heretofore the practice cruise was confined to performing various evolutions in Buzzard's or Gardner's Bay, a dull dreary ground, filling in as many evolutions as possible, all performed in open water without an objective point. What is more calculated to take the life out of people on board ships than this "all work and no play," after eight months of severe study and rigid discipline? Should not the practice cruise be made somewhat of a relaxation, combining practical instruction with a fair proportion of pleasure? I contend that the cruise just completed is infinitely superior to those of late years in general results, for it cannot be denied that working ship is much better learned in narrow passages, with dangers all around. It has been the practice formerly to give the cadets the deck for a few minutes in succession, each performing an evolution, while during this cruise the cadets had the deck night and day; groups of four taking regular watches for three days at a time. It must be remembered that the cadets had great advantage this year owing to the Saturday cruises of the Dale in the bay.

Another feature in this cruise is in sending the cadet-midshipmen in the tugs to visit various arm factories. The experiment, under Lieutenant-Commander W. M. Folger's management, met with splendid success, and I strongly recommend that at least two weeks be allotted to the cadet-midshipmen, out of their practice cruise, to make more extended visits to arm factories and ship-yards. This can be accomplished by letting the cadet-engineers go on leave August 15, by which time they will have finished their cruise, as was practically the case this summer.

I experienced but little fog and had most delightful weather between Mount Desert and Portland. I would respectfully recommend that the practice cruise might be most profitably and not unpleasantly carried out by spending the months of June and July on the New England coast, with Portland as a communicating point, and the month of August in Buzzard's and Gardner's Bay, &c., with Newport as a center, the tugs meeting the Constellation, and granting leave to the cadet-engineers August 15.

Before closing my report I must call your attention to the untiring energy of Lieutenant Mackenzie, the executive officer, and the indefatigable and careful worker, Lieut. S. W. Very, the navigator. The ship has been in some danger on two occasions, and these officers then, as well as at all other times, truly and with great zeal and competency filled their respective positions.

The watch-officers, Lieutenants Delehanty, Jasper, Paine, Masters Staunton and Bartlett, and Navigation Instructor Lieutenant Bur

nette, are all most worthy of commendation for the manner in which they performed their duties; and I shall always look back with pride at my good fortune in having been the commander of such superior officers and gentlemen. Surgeon Ruth, assisted by Passed Assistant Surgeon Whiting, were unremitting in their attention to the health and comfort of the cadets, while Paymaster Kenny, the commissary of the Academy, in addition to his duties as paymaster of this ship, kept a watchful eye over the caterers of the cadets' mess, and it is reported that the cadets never lived better on a practice cruise, though the expenses averaged about the same.

Hoping the late cruise and its results meet with your approbation,

I am, very respectfully, your obedient servant,

F. V. MCNAIR,

Commander U. S. N., Commanding Practice Squadron.

Rear-Admiral GEORGE B. BALCH, U. S. N.,
Superintendent Naval Academy, Annapolis, Md.

A.

LETTER OF REAR-ADMIRAL R. H. WYMAN.

No. 82.]

FLAG-SHIP POWHATAN,
Portland, Me., July 16, 1879.

SIR: Though it may be hardly in my province, I am, from my considerable experience with the practice-ship of the cadet-midshipmen, desirous of stating to the department, after visiting the United States ship Constellation, the excellent condition of every part of that vessel. Her appearance, maneuvers, and order reflect great credit upon her commander and officers.

Very respectfully, your obedient servant,

R. H. WYMAN,
Rear-Admiral,

Commanding U. S. Naval Force North Atlantic Station.

Hon. R. W. THOMPSON,
Secretary of the Navy, Washington, D. C.

B.

NAVY DEPARTMENT,
Washington, July 19, 1879.

SIR: I take pleasure in inclosing herewith copy of dispatch No. 82, from Rear-Admiral R. H. Wyman, commanding United States naval force on the North Atlantic Station, informing department of visit to the United States ship Constellation, under your command, and of her excellent condition in all respects.

Very respectfully,

R. W. THOMPSON,
Secretary of the Navy.

Commander F. V. MCNAIR, U. S. N.,
Commander United States Ship Constellation, Portland, Me.

C.

UNITED STATES SHIP CONSTELLATION,
Isle of Shoals, July 26, 1879.

SIR: In reply to your order of to-day, we have the honor to submit the following report in reference to the loss of the two bower anchors of this ship on the night of the 24th instant off Hog Island, Isles of Shoals.

1st. The probable speed of the ship before taking in sail was 4 knots. The sail was all plain sail except mainsail. The direction of the wind was NW., force 2-3. The course steered was NW. by W. until White Island light bore south, when we steered for it; subsequently hauling in for the lights on Star Island, being conned by the captain, who was forward.

2d. The time by the log from taking in sail to letting go the first anchor was ten minutes. The probable speed of the ship when the first anchor was let go was about two knots.

3d. Both lower cables were subjected to an unusually heavy strain last winter, when the ship was caught in the ice in the Chesapeake on her way from Annapolis to Norfolk. This probably weakened the cables. The broken link recovered from the starboard cable was defective. The bottom was found, in dragging for the lost anchors, to be very rocky.

The probable cause of parting the cable is, that in each case the anchor caught solidly in the rocks, and the cable, being already weakened and in one case defective, could not stand the strain put upon them.

Thirty fathoms of chain were lost with the starboard anchor and about 22½ with the port anchor.

4th. The means used to recover the anchors were as follows:

1st. Dragging for the chain with heavy grapnel and good scope of line.

2d. Dragging for the chain with a rake made of chain hooks as shown in the sketch.

3d. Sweeping for the fluke of the anchor with 60 fathoms of boat chain.

4th. Sweeping with hemp hawser heavily weighted.

We are, sir, very respectfully, your obedient servants,
M. R. I. MACKENZIE,
Lieutenant, U. S. N.
SAMUEL W. VERY,
Lieutenant, U. S. N.
D. DELEHANTY,
Lieutenant, U. S. N.

Commander F. V. MCNAIR, U. S. N.,
Commanding United States Ship Constellation.

D.

UNITED STATES SHIP CONSTELLATION,
Boston, August 30, 1879.

SIR: I have the honor to inform you that the Constellation, under my command, left Portland, Me., on the 22d instant, and arrived at this port on the evening of the 29th instant from a cruise *via* Casco Bay and the Isles of Shoals.

In coming through the Narrows Main Ship-channel, Boston Harbor,

with the pilot, Mr. William V. Abbott, in charge, on the last of the ebb, with very light easterly wind, the ship going about one-half knot over the ground one hour before low-water, this vessel touched bottom between the east end of Gallop's Island and Lovell's Island, with a slight rumbling sound of short duration, swung in towards the government wharf for manufactured buoys, and remained so grounded for about two hours. At low-water the ship heeled 1' 36", and showed 10 inches out of water aft. As the tide rose, the ship slowly pursued her course under all plain sail, without evidence whatever, except the change of bearings, that she had been aground. It is possible there may be a little copper off the false keel, but I doubt it. I do not consider the ship at all damaged; with a little more speed the ship would not have stopped.

The pilot declares he was in the channel, which, however, is at this place so narrow that a deviation of ten yards from its middle course would find shallow water. The ship entered the Narrows about 10 a. m.; the wind was so light that I was two hours making a quarter of a mile.

I am informed by General Thom, United States engineer, that he has frequently sounded and swept the locality where I touched, finding small detached bowlders, and, though suspecting the existence of others, has failed to find them. At his request, I have furnished him with the bearings and angles taken by the navigator, of which the inclosed, marked A, is a duplicate.

I am, very respectfully, your obedient servant,

F. V. MCNAIR,
Commander, Commanding Constellation.

Hon. R. W. THOMPSON,
Secretary of the Navy.

CRUISE OF THE PRACTICE TUGS MAYFLOWER AND STANDISH.

UNITED STATES PRACTICE TUG MAYFLOWER, *United States Naval Academy, Annapolis, Md., August 30, 1879.*

SIR: In accordance with the orders of the 2d of June last, from Commander F. V. McNair, United States Navy, then Acting Superintendent of the United States Naval Academy, I have the honor to submit the following report of the summer cruise of the practice tugs Mayflower and Standish.

The practice steamers having been reported ready for sea on the 11th of June, the first class of cadet-engineers was embarked on board the Mayflower, and the third class on board of the Standish, and on the 13th of June proceeded to sea.

The cruise terminated by the return of the practice tugs to this station on the 30th of August, 1879.

The following is a list of the points visited with the dates of arrival at each:

Points visited.	Dates of arrival.	Points visited.	Dates of arrival.
Sussex, Va.	June 14, 1879.	New York City	July 20, 1879.
New Castle, Del.	June 19, 1879.	New London, Conn.	July 27, 1879.
Wilmington, Del.	June 19, 1879.	New Bedford, Mass.	July 28, 1879.
Chester, Pa.	June 25, 1879.	Newport, R. I.	August 3, 1879.
Philadelphia, Pa.	July 2, 1879.	Bristol, R. I.	August 4, 1879.
Port Amboy, N. J.	July 13, 1879.	Newport, R. I.	August 6, 1879.
Cold Spring, N. Y.	July 16, 1879.		

Special cruise with cadet-midshipmen: New Haven, Conn., August 7, 1879.

Cruise with cadet-engineers continued: Newport, R. I., Washington, D. C., Norfolk, Va.

Table II contains a list of the various dock-yards and manufacturing establishments visited by the cadet-engineers at the points named in the preceding table.

Points visited.	Establishments visited.
Norfolk, Va.....	United States ship Galena, machine and boiler shops, copper shop, and United States ship Canandaigua.
New Castle, Del.....	Tube works, Messrs. Morris, Tasker & Co.
Wilmington, Del.....	The Harlan & Hollingworth Company; Edge Moor Iron Works (William Sellers & Co.); Lobdell Car Wheel Company; Jackson, Sharp & Co.; Seidell & Hastings; J. Morton Poole Co.; and Pusey, Jones & Co.
Chester, Pa.....	Ship-building works of Messrs. John Roach & Sons, Chester City water-works, and Eureka Cast Steel Company.
Philadelphia, Pa.....	Pennsylvania University, Phoenix Iron Company (Phoenixville, Pa.), Baldwin Locomotive Works, William Sellers & Co., Permanent International Exhibition Company, and William Cramp & Sons.
Perth Amboy, N. J.....	Bessemer Steel Works.
Bethlehem, Pa.....	Switch-Back.
Mauch Chunk, Pa.....	Prospect Coal Mine and breakers; wire-rope works of Messrs. Hazzard & Co.
Wilkesbarre, Pa.....	United States Military Academy at West Point and West Point Iron Foundry.
Cold Spring, N. Y.....	United States ship Tennessee, Brooklyn, Shenandoah, and Tallapoosa; Morgan Iron Works, Delamater Iron Works, Worthington Hydraulic Works, Stevens Institute of Technology, at Hoboken, N. J., and machine shops of the station.
New York City.....	United States ship Florida.
New London, Conn.....	Morse Twist Drill Company and New Bedford Copper Rolling Mills.
New Bedford, Mass.....	Torpedo station.
Newport, R. I.....	Herveshoff Manufacturing Company.
Bristol, R. I.....	Providence Steam-Engine Company and Corliss Engine Company.
Providence, R. I.....	Machine-shops of the station, United States ship Nipsic.
Washington, D. C.....	Revisited United States ship Galena and boiler shops.
Norfolk, Va.....	

Special cruise cadet-midshipmen.

Points visited.	Establishments visited.
New Haven, Conn.....	Winchester Repeating Arms Company.
Hartford, Conn.....	Colt's Arms Company and Gatling Gun Works.
Springfield, Mass.....	United States Arsenal.
Bridgeport, Conn.....	Union Metallic Cartridge Company.

The cadet-engineers of both classes have been required to take notes of all matters of professional interest which came under their observation, which notes were subsequently elaborated in their journals on their return on board the practice tugs. They have also been required to make one sketch of something novel or special in machinery for each visit on shore. Their books have been examined at stated intervals by the engineer instructors and by myself, and leave and other privileges granted the cadets have been dependent upon the appearance and quality of the work shown in the journals and sketches.

The cadet-engineers have further been required to stand regular watches, on board ship, as engineer officers, machinists, oilers, firemen, and stokers, whenever the practice tugs have been under way, and it gives me pleasure to report that many of them have shown great aptitude and proficiency in all the details of their profession. Opportunities were occasionally presented for them to manipulate special machinery, as, for example, at the Herveshoff establishment, at Bristol, R. I.

The conduct of the cadet-engineers has generally been excellent, and there are no special cases to bring to your notice.

The cadet-engineers were received with great cordiality by all the manufacturing firms whose establishments were visited, and great interest was shown and assistance rendered in furthering the object of the practice cruise.

I beg to make particular mention of gratuitous services rendered by the Lehigh Valley Coal Company, of Philadelphia, Pa., through its treasurer, Mr. Israel Morris, in placing a special train at the disposition of the cadet-engineers for a visit to the very interesting points in the Lehigh Valley coal and iron region, mentioned in Table II, and of the Reading Railroad Company for similar courtesy, which enabled the cadets to visit the Phoenixville forges. The cadets also received special attention and assistance from the firms of William Sellers & Co., of Philadelphia, the Edge Moor Iron Company, of Wilmington, Del., and the Herveshoff Manufacturing Company, of Bristol, R. I., and a hospitable welcome was extended to them by the faculty of the Stevens Institute of Technology, of Hoboken, N. J., and by that of the Pennsylvania University, at Philadelphia.

The detailed report of the professional aptitude, attention to duty, and conduct of each of the cadet engineers is herewith inclosed.

On falling in with the Constellation at Newport, R. I., on August 6, the programme of visits ordered for the cadet-engineers being completed, with the exception of those at the naval station, Washington, D. C., the acting superintendent ordered a five-day special cruise in the practice tugs for the first class of cadet-midshipmen, the object being a visit to a number of arms and cartridge manufacturing establishments in Massachusetts and Connecticut. The cadet-engineers were, therefore, transferred to the Constellation, and the first class of cadet-midshipmen embarked on board of the Mayflower and Standish, and at noon on August 7 the practice tugs sailed for New Haven, Conn.

From this point the cadets visited the establishment of the Winchester Repeating Arms Company, at New Haven, the Colt Patent Fire-Arms Manufacturing Company, together with its plant of machinery for the manufacture of the Gatling battery gun at Hartford, Conn., the United States Arsenal at Springfield, Mass., and the works of the Union Metallic Cartridge Company at Bridgeport, Conn.

I have great pleasure in reporting that the cadet-midshipmen showed great interest in all matters of a professional character which were presented to them; taking notes and sketches where possible, which were subsequently elaborated on their return to the practice vessels, for the inspection of the Superintendent. The visit happened at a particularly favorable moment as regards the work in progress, the cadets being afforded an opportunity of witnessing the details of the manufacture of the Hotchkiss magazine rifle recently adopted for the naval service, the new models of the Gatling gun, the Colt military revolver, the Springfield army musket, and military metallic ammunition.

The conduct and deportment of the cadet-midshipmen was all that could be desired, and received frequent commendations in the local press.

I beg to make especial mention of polite attention and assistance rendered by the following gentlemen, residents of Hartford, Conn., members of the firms whose establishments were visited: General Hawley, M. C.; Mr. Edgar T. Wells, secretary of the Gatling Gun Company; Mr. R. W. H. Jarvis, president of the Colt's Patent Fire-Arms Company, of Hartford, Conn.; to Col. J. G. Benton, U. S. A., commanding United States Arsenal at Springfield, Mass.; Gov. O. E. Winchester, president

of the Winchester Repeating Arms Company, at New Haven, Conn., and to Mr. A. C. Hobbs, superintendent of the Union Metallic Cartridge Company, of Bridgeport, Conn., and would respectfully suggest that an expression of the appreciation of the cordial reception tendered the officers and cadets composing the party be sent to them from the Naval Academy. These gentlemen all expressed a hope of visits by succeeding classes from the Naval Academy, and I would earnestly suggest and recommend that ten days be devoted in future summer cruises to similar work for the first class of cadet-midshipmen.

The success attending the visits of the cadet-engineers, during the past three months, shows what may be accomplished by the young gentlemen in the appreciation of mechanical appliances.

Very respectfully, &c.,

WM. FOLGER,
*Lieutenant-Commander, Commanding Mayflower,
and Senior Officer of Practice Tugs.*

Rear-Admiral GEORGE B. BALCH, U. S. N.,
Superintendent Naval Academy, Annapolis, Md.

UNITED STATES PRACTICE TUG MAYFLOWER,
Newport, R. I., August 12, 1879.

SIR: I have the honor to submit the following special report of the five days' cruise of the practice tugs Mayflower and Standish with the third class of cadet-midshipmen on a visit to the United States Arsenal at Springfield, Mass., and the arms and cartridge factories of Hartford, New Haven, and Bridgeport

In obedience to your orders of the 7th instant, the cadet-midshipmen having been received on board the practice tugs, the latter sailed the same date for New Haven, Conn., which point they reached at 11 p. m., anchoring in the outer harbor, inside the light-house.

At 1 p. m., the 8th instant, the practice tugs having steamed up to the city and moored head and stern off Long Wharf at daylight, permission having been previously obtained, the cadets were disembarked in charge of Lieutenant-Commander Folger, assisted by Lieutenants Miller and Paine, and proceeded to the establishment of the Winchester Repeating Arms Company on the north side of the city. The party was very cordially received by Governor Winchester, the president of the firm, and the secretary and superintendent were detailed to show the cadets through the works.

The successive steps in the manufacture of military small-arms and metallic cartridges, and the Winchester models of sporting arms, were shown to the cadets and all details explained. The visit was particularly valuable to the young gentlemen, as the military arm in process of manufacture is the Hotchkiss magazine rifle, with which the Bureau of Ordnance proposes to replace the Remington at present in use on board naval vessels. The party returned on board at 6 p. m.

Saturday, 9th August, at 7 a. m., the cadet-midshipmen from both tugs were sent on shore in charge of Lieutenant-Commander Folger, assisted by Lieutenants Miller and Paine, and took train at 8.10 a. m. for Hartford, Conn., arriving at 9 a. m. The party proceeded at once to Colt's Armory, where the details of the manufacture of military revolvers and Gatling guns were shown the cadets by the superintendent and

manager of the works. The several new models of Gatling guns were fired by the employes of the armory, in some cases reaching a speed of 1,200 shots per minute.

At 12 m. the cadets, invited by Colonel Fox, the acting adjutant-general of the State, drove to the new capitol building and thence to the hotel, where dinner for the party had been ordered.

At 1.30 p. m. the party again took train and proceeded to Springfield, Mass., where they were met at the station by a detail of officers sent by Col. J. G. Benton, U. S. A., commanding the arsenal. Reaching the arsenal the party was divided into squads of fifteen, each in charge of an officer, and conducted through the entire establishment.

The details of the manufacture of the Springfield rifle were shown the cadets, and several of the more interesting and important operations, for example the "stocking" and the "firing trial," were done for their especial benefit.

Colonel Benton was particularly cordial to the party, taking pains to explain personally the smallest detail of the work in progress. The whole party was hospitably entertained at his quarters on concluding the inspection of the work-shops, and at 6 p. m. took train for New Haven, reaching the practice tugs at 8 p. m.

Sunday, 10th August, such of the cadets as desired it were allowed to visit the shore.

Monday, 11th August, arrangements having been previously made, and a cordial invitation extended to the cadet-midshipmen, the first class was disembarked at 7 a. m., and in charge of the same officers proceeded by train to Bridgeport, Conn., where the factory of the Union Metallic Cartridge Company is located. By the politeness of the New York, New Haven and Hartford Railroad Company the special cadet car was dropped opposite the establishment, which gave the cadets the whole forenoon in which to instruct themselves in the subject of cartridge making. The recent large orders which the Union Metallic Cartridge Company have filled for the Russian and Turkish Governments have necessitated the aggregation of a number of mechanical appliances, which are unequaled in the country, and the visit cannot fail to have been extremely instructive to the cadet-midshipmen. Mr. A. C. Hobbs, the superintendent, and his son, a member of the firm, showed the cadets every attention, and accompanied the party through the entire establishment.

The party returned to New Haven and the practice tugs at 12.40 p. m., and at 2 p. m. sailed for Newport, R. I., which point they reached at 9 a. m. this date, having anchored for nine hours off New London, Conn.

I would respectfully suggest that the thanks of the Superintendent be tendered to Mr. Edgar T. Welles, secretary of the Gatling Gun Company; to Mr. Richard W. H. Jarvis, president of the Colt's Patent Fire-Arms Manufacturing Company, of Hartford, Conn.; to Col. J. G. Benton, U. S. A., commanding United States Arsenal, at Springfield, Mass.; to Gov. O. E. Winchester, president of the Winchester Repeating-Arms Company, at New Haven, Conn.; and to Mr. A. C. Hobbs, superintendent of the Union Metallic Cartridge Company, of Bridgeport, Conn., for the cordiality with which these gentlemen received the party at their several establishments and the interest they showed in the measures taken for the instruction of the cadet-midshipmen.

I have great pleasure in reporting that the cadets showed a sincere desire to acquire information on the various subjects presented to them,

and I believe the cruise has added materially to their stock of professional knowledge.

The proprietors of all the establishments visited showed a sincere desire to assist the accomplishment of the object of the cruise, expressing frequently the hope of the visit of succeeding classes from the Naval Academy; and I would earnestly suggest and recommend that ten days be devoted in future summer cruises to similar work for the cadet-midshipmen.

The success attending the visits of the cadet-engineers during the past three months shows what the young gentlemen may accomplish in the appreciation of mechanical appliances.

The conduct and deportment of the cadets has, without exception, been all that could be desired of them, and has elicited frequent commendation in the daily local papers.

I am, sir, very respectfully, &c.,

WM. FOLGER,

*Lieutenant Commander, Commanding Mayflower, and
Senior Officer of the Practice Tugs.*

Commander F. V. McNAIR, U. S. N.,

*Commanding United States Steamer Constellation, and
Senior Officer of Practice Ship.*

NOTE.—At 2.05 p. m., 18th August, 1879, the Constellation sailed from Newport, R. I., with a light breeze from north and east, and the barometer slowly falling from 30.12 at noon, to 30.06 at 3 p. m. On rounding Point Judith, at 4 p. m., the wind commenced to freshen and the weather looked threatening, the barometer at 4 reading 30.00 and at 5, 29.90. Very heavy rain accompanied fresh squalls from N. E., and the topmast studding-sail, royals, and flying jib were taken in. All land was lost sight of, both the Connecticut shore to the northward, three miles away, and Block Island, farther away to the southward and eastward. Headed in for the land, and when about half a mile away from the boldest part of Fisher's Island, saw it for a few minutes. Wind increasing, shortened sail still farther, wore ship, and at 7, brought by the wind on the port tack heading about E. S. E., caught a glimpse of the lights on Little Gull and the Race, and wore again, intending to pass through the Race, and anchored in Fisher's Island Sound, heading then N. W. by the wind. Could not see the red flash of the Race, although the light was less than a mile away, and the white showed distinctly. Lost the light; wore again and stood E. S. E. by the wind; at 7.30, reduced sail to fore-topmast stay-sail, close-reefed fore and main topsails and spankers; at about 7.30 got another view of Race and Little Gull lights and found we were near the Cesberns Rock in Block Island Sound; so wore again, heading N. W. by W., and losing the lights soon afterwards. Barometer falling very rapidly and wind increasing to whole gale, backing slowly. Raining hard until midnight, when it suddenly ceased. At about 9, got sight of Little Gull light, bearing W. N. W., and wore ship, standing E. by S., slowly coming up to N. E. at a little after midnight, and to north at 3.30 a. m.; reduced sail still farther between 8 and midnight to fore storm-staysail, gorse-winged main trysail and storm mizzen; sent down light yards and bent sheet cables. At about 1.30 a. m. wind moderated very much; all lights were in sight (Montauk, Little Gull, Race Rock, Watch Hill, and Eel Grass light-ship), and, the ship being in Block Island Sound, clear of all danger, the men were given their hammocks for the first time

The barometer record is given below, attached thermometer 66° to 68°.

August 18:		10.45 p. m.	29.36
Noon	30.12	11 p. m.	.37
1 p. m.	.09	11.30 p. m.	.38
2 p. m.	.07	11.45 p. m.	.40
3 p. m.	.06	Midnight	.45
4 p. m.	.00	August 19:	
5 p. m.	29.90	0.15 a. m.	29.45
6 p. m.	.85	0.30 a. m.	.48
7 p. m.	.73	0.45 a. m.	.53
7.30 p. m.	.67	1 a. m.	.58
8 p. m.	.53	1.15 a. m.	.60
9 p. m.	.42	1.30 a. m.	.66
9.30 p. m.	.35	1.45 a. m.	.67
10 p. m.	.35	2 a. m.	.70
11.15 p. m.	.33	2.30 a. m.	.71
10.30 p. m.	.34		

Barometer record from 10 p. m., August 18, to 2.30 p. m., August 19, inclusive, by W. J. Barnette, lieutenant, United States Navy.

All other records by Samuel W. Very, lieutenant, United States Navy.

UNITED STATES PRACTICE SHIP CONSTELLATION, *Newport, R. I., August 7, 1879.*

SIR: As soon as the first class of cadet-midshipmen has been transferred to the practice tugs Mayflower and Standish, and the cadet-engineers to the Constellation, in accordance with verbal instructions already given, you will proceed on a cruise for the professional instruction of the cadet-midshipmen, visiting the ports of New Haven, Conn., and Bridgeport, Conn.

From New Haven you will take charge of the class, and with two instructors, besides yourself, visit Hartford, Conn., and Springfield, Mass. The cadets, and the officers having them in charge, will pay their own expenses, you first having made as favorable terms as practicable with the railways and hotels you may use on the route.

You will visit and cause instruction to be given at all the arms and cartridge manufactories at the various points mentioned above.

The superintendent desires that the cadets shall take notes of all matters of professional interest which shall come under their observation, these notes to be subsequently enlarged and developed on the return of the cadets to the practice vessels and submitted to himself for examination upon rejoining the Constellation.

You will also require of each of the cadet-midshipmen a written description of the engines and boilers of the Mayflower or Standish. A description lecture upon the machinery of the practice tugs will be given during the cruise by the senior engineer officer of each vessel.

You will further require from each of the cadet-midshipmen a fair copy of a small harbor chart of some United States port, with the courses, corrected for compass errors, which the practice tugs should steer in entering such port.

The superintendent desires that this duty shall terminate and the practice tugs rejoin the Constellation at Newport in August.

A copy of these orders has been sent to Lieut. Commander Dickens, commanding the Standish. He will conform to your orders and movements.

Respectfully, &c.,

F. V. McNAIR,

Commander, Commanding Constellation, and
Acting Superintendent Naval Academy.

Lieut. Commander W. M. FOLGER, U. S. N.,
Commanding Mayflower, &c.

Estimates for the support of the United States Naval Academy, for the fiscal year ending June 30, 1881.

PAY OF PROFESSORS AND OTHERS.

One professor of modern languages, head of department	\$2,500 00
One professor of drawing, head of department	2,500 00
Three professors, viz, one of physics, one of chemistry, one of Spanish, assistants, at \$2,200 each	6,600 00
Seven assistant professors, viz, four of French, two of English studies, history and law, one of drawing, at \$1,800 each	12,600 00
Sword-master, at \$1,500, and two assistants, at \$1,000 each	3,500 00
Boxing-master and gymnast	1,200 00
Assistant librarian	1,400 00
Secretary	1,800 00
Three clerks to Superintendent, at \$1,200, \$1,000, and \$800 each	3,000 00
One clerk to commandant of cadets	1,000 00
One clerk to paymaster to audit cadets' accounts	1,000 00
One dentist	1,600 00
One baker	600 00
One mechanic in department of physics and chemistry—making and repairing instruments and apparatus	600 00
One messman, at \$288; one cook, at \$325.50; and messenger to Superintendent, at \$600	1,213 50
One armorer, at \$529.50; gunners' mate, at \$469.50, and quarter-gunner, at \$409.50	1,408 50
One cockswain for gymnasium	\$469 50
One seaman in department seamanship	349 50
One seaman in department of astronomy	349 50
One seaman in department of physics and chemistry	349 50
	<hr/>
One bandmaster, at \$528, and 21 first-class musicians, at \$348 each	1,518 00
Seven second-class musicians, at \$300 each	7,836 00
	<hr/>
	2,100 00
Amount appropriated under this head—"Pay of professors and others" for the year ending June 30, 1880	53,976 00
	<hr/>
	53,126 00
Excess	<hr/>
	850 00

NOTE.—This excess is occasioned by inserting an item of \$1,600 for the pay of a dentist to attend the cadets, in lieu of an item of \$750 heretofore appropriated for the pay of an apothecary; the acting assistant surgeon, who has hitherto performed the duty of dentist, having been mustered out of the service, in conformity with the act of Congress to abolish the volunteer navy, approved February, 1879.

PAY OF WATCHMEN AND OTHERS.

Captain of the watch and weigher, at \$2.50 per diem	\$912 50
Four watchmen, at \$2 per diem each	2,920 00
Foreman of the gas and steam-heating works of the Academy, at \$5 per diem	1,825 00
Ten attendants at gas and steam-heating works—one at \$3, one at \$2.50, and eight at \$2 per diem each	7,847 50
One steam-pipe fitter, at \$2 per diem	730 00
One foreman of joiners, one foreman of painters, and one foreman of masons, at \$3.50 per diem each	3,832 50
Two joiners, one painter, and one mason, at \$2.50 per diem each	3,650 00
One tinner, one gas-fitter, and one blacksmith, at \$2.50 per diem each	2,737 50
	<hr/>
	24,455 00
Amount appropriated for the year ending June 30, 1880	24,455 00
	<hr/>

PAY OF MECHANICS AND OTHERS.

One mechanic at workshop, at \$2.25 per diem	\$821 25
One master-laborer to keep public grounds in order, at \$2.28 per diem	832 20
Fourteen laborers, to assist in the same—three at \$2 and eleven at \$1.50 per diem each	8,212 50
One laborer to superintend quarters of cadets, public grounds, &c., at \$2 per diem	730 00

Six attendants—one at chapel, one at recitation hall, one at offices, one at library, one at paymaster's office, and one at store, at \$20 per month each	\$1,440 00
Twenty servants, to keep in order and attend to cadets' quarters, public buildings, &c., at \$20 per month each	4,800 00

Amount appropriated for the year ending June 30, 1880	16,835 95
	<u>16,835 95</u>

PAY IN DEPARTMENT OF STEAM-ENGINEERING.

One master-machinist, at \$3.50 per diem	\$1,277 50
One boiler-maker, at \$3.50 per diem	1,277 50
One pattern-maker, at \$3.50 per diem	1,277 50
Two machinists, at \$2.50 per diem each	1,825 00
One blacksmith, at \$2.50 per diem	912 50
One molder, at \$2.50 per diem	912 50
Two laborers, at \$1.50 per diem each	1,095 00
	<u>8,577 50</u>
Amount appropriated for the year ending June 30, 1880	<u>8,577 50</u>

REPAIRS AND IMPROVEMENTS.

For the necessary repairs of public buildings, pavements, wharves, and walks inclosing the grounds of the Naval Academy; for improvements of the same, and for furniture, fixtures, &c	\$21,000 00
Appropriated for the year ending June 30, 1880	<u>21,000 00</u>

HEATING AND LIGHTING.

For fuel for heating and lighting the Academy and school-ships	\$17 000 00
Appropriated for the year ending June 30, 1880	<u>17,000 00</u>

CONTINGENT EXPENSES NAVAL ACADEMY.

For the purchase of books for the library	\$2,000 00
For stationery, blank-books, models, maps, &c., and for text-books for the use of instructors	2,000 00
For expenses of the Board of Visitors	2,600 00
For the purchase of chemicals, apparatus and instruments in the department of physics and chemistry, and for the repairs of the same	2,500 00
For the purchase of gas and steam machinery, steam pipe and fittings, rent of buildings for the use of the Academy, freight, cartage, water, music, musical and astronomical instruments, uniforms for the bandmen, telegraphing, and for the feed and maintenance of teams, and for the current expenses and repairs of all kinds, and for incidental labor and expenses not applicable to any other appropriation	34,600 00
For stores in the department of steam-engineering	800 00
For materials for repairs in steam-machinery	1,000 00
	<u>45,500 00</u>
Appropriated for the year ending June 30, 1880	<u>45,500 00</u>

RECAPITULATION.

Pay of professors and others	\$53,976 00
Pay of watchmen and others	24,455 00
Pay of mechanics and others	16,835 95
Pay in department of steam-engineering	8,577 50
Repairs and improvements	21,000 00
Heating and lighting	17,000 00
Contingent expenses	<u>45,500 00</u>
Amount estimated for	\$187,344 45
Appropriated for year ending June 30, 1880	<u>186,494 45</u>
	850 00

Respectfully submitted.

GEO. B. BALCH,
Rear-Admiral, Superintendent.

HON. R. W. THOMPSON,
Secretary of the Navy, Washington, D. C.

No. 3.—BUREAU OF ORDNANCE.

BUREAU OF ORDNANCE, NAVY DEPARTMENT,
Washington City, October 1, 1879.

SIR: I herewith submit the annual report of the operations of the Bureau of Ordnance, with detailed estimates of the amounts required for the fiscal year ending June 30, 1881.

ESTIMATES.

1. Labor, tools, materials, and fuel used in fitting ships for service, and preservation of ordnance and ordnance stores, repairs to buildings, magazines, wharves, gun-parks, tugs, lighters, and boats.....	\$225,000 00
2. Torpedo service	45,000 00
3. Miscellaneous items, freight, telegrams, postage, advertising, &c	3,000 00
4. Civil establishment at navy-yards.....	11,886 25

284,886 25

The estimates are the same as the sums appropriated for the current year, based on the actual expenditures at the several yards and stations in fitting ships for sea and in the preservation of ordnance material.

The last year has been one of great advance in developing the force of penetration of rifle projectiles and of concurrent efforts to produce armor of greater resistance with the same weight. In the case of the gun, it has been done by the application of well-known principles, but increase of length and diminution of caliber are perhaps carried to an excess. With the reduction of caliber, the shell is necessarily of small capacity, incapable of inflicting vital injury, and combats would be of long duration as before the introduction of shell firing. In naval combats the object is to lodge a powerful mine in the side or in the interior of the ship, which requires a large capacity shell; to penetrate armor plates, small diameter and great hardness and tenacity of material in the shell are necessary. It is probable that we have not reached a final solution of the problem, and that nothing has been lost by our enforced delay. It is, however, quite evident that all the older systems of naval ordnance are obsolete and monster iron-clads of less importance. The progress of metallurgy gives promise of obtaining suitable material with which to construct our future armaments whenever proper appropriations are made.

The monitors now building will each require two 10-inch rifles, which is deemed the most suitable caliber, as their projectiles will penetrate any vessel now built or building which can safely cross the Atlantic.

The conversion of XI-inch smooth-bore to 8-inch muzzle-loading rifles is continued, as it has proved a very safe and efficient gun.

The 60-pounder muzzle-loading Parrott rifles are also being converted to breech loaders.

The 80-pounder breech loader has been mounted on the Tennessee.

The Hotchkiss magazine rifle, caliber .45, has been adopted for the naval service, and is now issued to ships. It is an arm of remarkable simplicity and efficiency, not likely to be soon superseded by later inventions, and is one to which detachable magazines hereafter devised may be applied.

With the change of caliber of the shoulder gun it became necessary, in order to avoid confusion on board ship, to alter the machine guns to the same caliber. The bureau has therefore made arrangements for the con-

version of 30 of the Gatlings to the latest and best model, which is much more efficient.

No funds have been available for the purchase of the larger class, such as the Hotchkiss revolver cannon, which now form such powerful adjuncts to the defense of ships against movable torpedoes.

The Torpedo School at Newport has graduated the usual class of 20 members.

But little improvement has been made in either the offensive or defensive use of torpedoes. Some experiments have been made with a very simple aggressive torpedo, devised by Captain John Ericsson, to be projected from a gun of heavy caliber by a charge of powder, the force limited and controlled by the amount of air space. It was demonstrated that the torpedo pursued a course corresponding with the curved line of flight, the final inclination coincident with the angle of fall; also that the trajectory could be flattened and the angle of inclination of the torpedo varied by the use of vanes or wings. Further experiment will be necessary to determine the conditions requisite in practical use.

I have the honor to be, very respectfully, your obedient servant,

WILLIAM N. JEFFERS,

Commodore, Chief of Bureau.

Hon. R. W. THOMPSON,
Secretary of the Navy.

*Estimates of appropriations required for the service of the fiscal year ending June 30, 1881,
by the Bureau of Ordnance, Navy Department.*

Detailed objects of expenditure, and explanations.	Estimated amount which will be required for each detailed object of expenditure.	Amount appropriated for the current fiscal year ending June 30, 1880.
SALARIES.		
Chief clerk (Rev. Stat., p. 70, sec. 416; act June 21, 1879).....	\$1,800 00	
Draftsman (Rev. Stat., p. 70, sec. 416; act June 21, 1879).....	1,800 00	
One clerk of class three (Rev. Stat., p. 26, sec. 167; act June 21, 1879).....	1,600 00	
One clerk of class two (Rev. Stat., p. 26, sec. 167; act June 21, 1879).....	1,400 00	
One assistant messenger (act June 21, 1879).....	720 00	
One laborer (act June 21, 1879).....	660 00	
	7,980 00	\$7,980 00
CONTINGENT.		
Stationery, books, and miscellaneous items (appropriated).....	400 00	400 00
ORDNANCE AND ORDNANCE MATERIAL.		
For fuel, tools, and materials of all kinds, necessary in carrying on the current daily work of the mechanical branches of the ordnance department of the several navy-yards, magazines, and stations; for labor at all the navy-yards, magazines, and stations, in fitting ships for sea, and in preserving ordnance material; for necessary repairs to ordnance buildings, magazines, gun-parks, boats, lighters, wharves, machinery, and other necessaries of the like character (appropriated act of February 14, 1879).....	225,000 00	225,000 00
CONTINGENT, ORDNANCE.		
For freight to foreign and home stations; advertising and auctioneers' fees; cartage and express charges; repairs to fire engines; gas and water pipes; ramrod water tax at magazines; toll, ferrage, foreign postage, and telegrams (appropriated act of February 14, 1879).....	3,000 00	3,000 00

Estimates of appropriations, &c.—Continued.

Detailed objects of expenditure, and explanations.	Estimated amount which will be required for each detailed object of expenditure.	Amount appropriated for the current fiscal year ending June 30, 1880.
CIVIL ESTABLISHMENT.		
At navy-yard Portsmouth, N. H.:		
One clerk (appropriated act February 14, 1879)	\$1,300 00	
At navy-yard Boston, Mass.:		
One clerk (appropriated act February 14, 1879)	1,400 00	
At navy-yard Brooklyn, N. Y.:		
One clerk (appropriated act February 14, 1879)	1,400 00	
One writer (appropriated act February 14, 1879)	1,017 25	
At navy-yard League Island, Pa.:		
One writer (appropriated act February 14, 1879)	1,017 25	
At navy-yard Washington D. C.:		
One clerk (appropriated act February 14, 1879)	1,400 00	
One writer (appropriated act February 14, 1879)	1,017 25	
At navy-yard Norfolk, Va.:		
One clerk (appropriated act February 14, 1879)	1,300 00	
At navy-yard Pensacola, Fla.:		
One writer (appropriated act February 14, 1879)	1,017 25	
At navy-yard Mare Island, Cal.:		
One writer (appropriated act February 14, 1879)	1,017 25	
	11,886 25	\$11,886 25
TORPEDO CORPS.		
For labor, material, freight and express charges; general repairs to grounds, buildings, wharves, and boats; instruction and general torpedo experiments (appropriated act February 14, 1879)	45,000 00	45,000 00

Respectfully submitted.

WILLIAM N. JEFFERS,
Commodore, Chief of Bureau.

BUREAU OF ORDNANCE, October 1, 1879.

Manufactures and preparations at the various navy-yards for the year ending June 30, 1879.

ARTICLES UNDER PROPORTION TO EACH GUN.

- 6 8-inch M. L. R. carriages, altered from XI-inch.
- 4 sets 8-inch M. L. R. side sights, complete.
- 8 sets 8-inch M. L. R. central sights, complete.
- 4 8-inch M. L. R. side-sight boxes.
- 2 8-inch M. L. R. central-sight boxes.
- 2 8-inch M. L. R. reinforce-sights.
- 44 8-inch M. L. R. central-sight covers.
- 4 sets 8-inch M. L. R. central-sight bolts and nuts.
- 13 8-inch M. L. R. standard shell-bags.
- 17 8-inch M. L. R. shell-bag formers.
- 50 8-inch M. L. R. canister.
- 50 8-inch M. L. R. canister-boxes.
- 90 8-inch M. L. R. gun-tackles.
- 6 8-inch M. L. R. muzzle-bags.
- 3 8-inch M. L. R. breechings.
- 7 sets 8-inch M. L. R. gun-gripes.
- 19 8-inch M. L. R. sponges, woolen.
- 8 8-inch M. L. R. sponges, bristle.
- 14 8-inch M. L. R. passing-boxes.
- 8 8-inch M. L. R. shell-boxes.
- 15 8-inch M. L. R. sponge caps.
- 5 8-inch M. L. R. vent impression-takers.
- 14 8-inch M. L. R. shell-loaders.
- 35 8-inch M. L. R. sponge-covers, sheepskin.

- 6 60-pounder M. L. and B. L. R. iron carriages.
- 6 60-pounder M. L. and B. L. R. iron carriage directing-bars.
- 1 60-pounder M. L. R. breeching-shackle.
- 44 60-pounder M. L. R. pivot-bolts.
- 23 60-pounder M. L. R. gun-tackles (in and out).
- 11 sets 60-pounder M. L. R. elevating-gear patches.
- 3 60-pounder M. L. R. sight-covers.
- 15 60-pounder M. L. R. round shot.
- 14 60-pounder M. L. R. train-ropes.
- 4 60-pounder M. L. R. breechings.
- 6 sets 60-pounder M. L. R. gun-gripes.
- 173 60-pounder M. L. R. shell-boxes.
- 1 60-pounder M. L. R. worm.
- 3 60-pounder M. L. R. chocking-quoins.
- 2 60-pounder M. L. R. tompons, with wads and laniards.
- 3 60-pounder M. L. R. sponges, woolen.
- 4 60-pounder M. L. R. sponges, bristle.
- 4 60-pounder M. L. R. sponge-caps.
- 1 60-pounder M. L. R. ladle.
- 5 60-pounder M. L. R. muzzle-bags.
- 5 60-pounder M. L. R. junk-wads.
- 12 60-pounder M. L. R. linchpins.
- 13 60-pounder M. L. R. axle-washers.
- 7 60-pounder M. L. R. sponge-covers, sheepskin.
- 5 20-pounder B. L. Rifles.
- 4 20-pounder B. L. R. carriages.
- 12 20-pounder B. L. R. carriage directing-bars.
- 18 20-pounder B. L. R. breech-sights.
- 12 20-pounder B. L. R. elevating-screw pins.
- 14 20-pounder B. L. R. elevating screws.
- 15 20-pounder B. L. R. gun-tackles.
- 155 20-pounder B. L. R. shells.
- 11 20-pounder R. L. R. shell-boxes.
- 4 20-pounder B. L. R. gun-gripes.
- 2 20-pounder B. L. R. gun-covers.
- 4 20-pounder B. L. R. chocking-quoins.
- 12 20-pounder B. L. R. pivot-bolts.
- 2 20-pounder B. L. R. breechings.
- 1, 123 20-pounder B. L. R. sabots.
- 8 20-pounder B. L. R. sight thumbscrews.
- 12 20-pounder B. L. R. dummy shot.
- 12 20-pounder B. L. R. dummy cartridges.
- 12 20-pounder B. L. R. sponges, head and staves.
- 6 20-pounder B. L. R. sponges, woolen.
- 2 20-pounder B. L. R. muzzle-bags.
- 2 20-pounder B. L. R. worms and ladles.
- 14 20-pounder B. L. R. linchpins.
- 32 20-pounder B. L. R. shell-box beackets.
- 13 20-pounder B. L. R. sponge-caps.
- 10 20-pounder B. L. R. thumbblatches.
- 14 20-pounder B. L. R. Broadwell rings.
- 9 20-pounder B. L. R. wrenches.
- 1 XI-inch breeching.
- 24 XI-inch tackles.
- 6 XI-inch trunnion-rings.
- 2 XI-inch shell-gauges.
- 3 XI-inch shell-loaders.
- 2 XI-inch shot-tongs.
- 13 XI-inch canister.
- 1 XI-inch loading-ladle.
- 1 XI-inch vent impression-taker.
- 6 XI-inch sponge-covers, sheepskin.
- 3 XI-inch muzzle-bags.
- 12 XI-inch shell-boxes.
- 6 XI-inch rail-chocks.
- 6 XI-inch transom-quoins.
- 24 IX-inch breeching.
- 56 IX-inch tackles.
- 10 sets IX-inch gun-gripes.
- 27 IX-inch canister.

- 12 IX-inch muzzle-bags.
- 1 IX-inch vent impression-taker.
- 14 IX-inch shell-boxes.
- 2 IX-inch tompons, wads, and laniards.
- 6 IX-inch axle washers and pins.
- 18 VIII-inch tompons, wads, and laniards.
- 132 metal blocks, double.
- 8 metal blocks, single.
- 4 handspikes.
- 26 chocking-quoins.
- 73 wash-deck chocks.
- 77 fire-bucket laniards.
- 546 port-laniards.
- 24 shell-whips.
- 17 vent-guards.
- 10 division-boxes.
- 50 selvagees.
- 10 shell-bearers.
- 6 division-tubs.
- 2,500 friction-primers, quill.
- 243 friction-primer laniards, complete.
- 129 friction-primer laniards, runners.
- 220 friction-primer laniards, hooks.
- 35 fuse-wrenches, No. 1.
- 31 fuse wrenches, No. 2.

HOWITZERS, EQUIPMENTS, ETC.

- 8 3-inch B. L. H. steel.
- 8 3-inch B. L. H. field-carriages.
- 1 3-inch B. L. H. boat-carriage.
- 22 3-inch B. L. H. field-carriage wheels.
- 20 3-inch B. L. H. linchpins.
- 30 3-inch B. L. H. washers.
- 1,194 3-inch B. L. H. shells.
- 145 3-inch B. L. H. shell-boxes.
- 16 3-inch B. L. H. breech-sights.
- 36 3-inch B. L. H. elevating-screw pins.
- 244 3-inch B. L. H. shrapnel.
- 82 3-inch B. L. H. shrapnel bouchings.
- 300 pounds 3-inch B. L. H. shrapnel balls.
- 61 3-inch B. L. H. beackets for shell-boxes.
- 7 3-inch B. L. H. bristle sponges.
- 5 3-inch B. L. H. sponge-caps, canvas.
- 3,371 3-inch B. L. H. cartridge-bags.
- 16 3-inch B. L. H. collar-latches.
- 16 3-inch B. L. H. thumbblatches.
- 12 3-inch B. L. H. thumbscrews.
- 1,739 3-inch B. L. H. sabots.
- 5 3-inch B. L. H. sponge-buckets.
- 46 3-inch B. L. H. sponge-bucket rings.
- 6 3-inch B. L. H. sponge-bucket heads.
- 30 3-inch B. L. H. caisson-boxes.
- 16 sets B. L. H. caisson-box fittings.
- 15 3-inch B. L. H. Broadwell rings.
- 17 3-inch B. L. H. Broadwell ring extractors.
- 22 3-inch B. L. H. wrenches.
- 3 3-inch B. L. H. sponge-staves.
- 23 3-inch B. L. H. dummy shot.
- 1 3-inch B. L. H. cover.
- 300 3-inch B. L. H. shell-plugs.
- 1,565 3-inch B. L. H. Boxer fuses.
- 1,300 3-inch B. L. H. Boxer fuse-igniters.
- 9 3-inch B. L. H. Boxer fuse-clamps.
- 2 3-inch B. L. H. Boxer fuse-cutters.
- 1,712 3-inch B. L. H. Boxer fuse-stocks.
- 4 sets 12-pounder boat skids and tracks.
- 6 12-pounder pivot-clamps.
- 1 12-pounder shell-chargers.
- 2 12-pounder formers for cartridge-bag.

- 1 12-pounder worm.
- 13 12-pounder drag-ropes.
- 62 12-pounder drag-rope toggles.
- 13 12-pounder compressor bolts and nuts.
- 50 12-pounder lock-bolts.
- 1 12-pounder sponge-cap.
- 12 12-pounder sponge-covers, woolen.
- 6 sets 12-pounder wheel-chocks.
- 100 12-pounder cartridge-bags.
- 150 12-pounder cartridge-bag rings.
- 11 12-pounder haversacks.
- 1 Gatling gun cover.

SMALL-ARMS.

- 307 rear-sight guards.
- 154 rear-sight guard-straps.
- 1 arm-chest.
- 7 armorers' tool-chests.
- 7 sets armorers' tools.
- 3 small-arm targets.

MAGAZINE STORES.

- 500 32-pounder cartridge-bags.
- 200 3-pound saluting-charges.
- 100 4-pound saluting-charges.
- 300 VIII-inch shell charges.
- 25 8-inch M. L. R. cartridge-bags.
- 900 20-pounder B. L. R. cartridge-bags.
- 2,771 Bormann fuses.
- 2,936 Bormann fuse-stocks.
- 3,410 N. M. S. fuses, 5", for spherical shell.
- 12 N. M. S. fuses, 7", for spherical shell.
- 759 N. M. S. fuses, 15", for spherical shell.
- 360 N. M. S. fuses, 20", for spherical shell.
- 1,042 N. M. S. fuses, 5", for M. L. R. shell.
- 100 N. M. S. fuses, 10", for M. L. R. shell.
- 100 N. M. S. fuses, 15", for M. L. R. shell.
- 16,000 fuse-plugs.
- 956 fuse-stocks.
- 1,000 fuse-adapters.
- 8 magazine-screens.
- 14 magazine-dressers.
- 1 cartridge-bag former, 32-pounder.
- 1 cartridge-bag former, 20-pounder.
- 1 cartridge-bag former, XI-inch.
- 8 cartridge-bag formers, 8-inch M. L. R.
- 13 powder-whips.
- 14 funnels for filling 8-inch M. L. R. shell.
- 14 filling-rods for M. L. R. shell.

MISCELLANEOUS.

- 52 60-pounder pivot-sockets.
- 8 60-pounder pivot-socket covers.
- 11 60-pounder clevis-bolts.
- 10 20-pounder pivot-sockets.
- 6 60-pounder D. B. blocks.
- 83 arm-chest hinges.
- 43 arm-chest hasps.
- 43 arm-chest staples.
- 4 lashing-thimbles.
- 2 shifting-chocks.
- 6 powder-scuttle funnels.
- 15 pressure-gauges.
- 45 pressure-gauge boxes.
- 1,067 pressure-gauge disks.
- 2 pressure-gauge packing-cutters.
- 2 pressure-gauge packing-formers.

- 288 pressure-gauge gas-checks.
- 4 pressure-gauge wrenches.
- 9 pressure-gauge packing-rings.
- 2 IX-inch copper chambers.
- 2 IX-inch copper chamber extractors.
- 24 sweep-pieces.
- 2 gun pendulums.
- 1 rigging-screw.
- 1 densimeter.
- 10 test specimens, steel.
- 10 test specimens, bronze.
- 10 test specimens, wrought iron.
- 10 test specimens, cast iron.
- 2 60-pounder cylinder-gauges.
- 7 elevating-screw-hole cutters.
- 8 gun-studs for primer.
- 1 chart-case.
- 1 tackle-purchase, 14-inch.
- 1 tackle-purchase, 9-inch.
- 1 shell-tap, 12-pounder.
- 1 shell-tap wrench.
- 20 sponge-worms.
- 6 sets fuse taps and plates.
- 2 saluting-hammers.
- 2 passing-box formers.
- 100 handspike-pins.
- 2 gun-boxes.
- 20 packing-boxes.
- 29 shell-stands.
- 25 key-blanks.
- 1 fire-tub grating.
- 6 mats.
- 44 battle-ax brackets.
- 73 sets rifle-brackets.
- 100 sets cutlass-brackets.
- 12 handles for armorer's tool-chest.
- 6 hasps for armorer's tool-chest.
- 6 staples for armorer's tool-chest.
- 12 hinges for armorer's tool-chest.
- 4 hooks for rammers and sponges.
- 150 hooks for port-laniards.
- 12 hooks for drag-ropes.
- 12 thimbles for drag-ropes.
- 16 thimbles for breeching.
- 6 tin cans.
- 136 bracket-screws.
- 4 stationery packing-boxes.
- 12 target-frames.
- 18 can-hooks.
- 27 swabs.
- 1 powder-flag.
- 2 gun-slings.
- 1 pair box-hooks.
- Repairs to stores on hand.
- Repairs to stores for vessels in commission.
- Repairs to stores for vessels fitting.
- Repairs to buildings, wharves, shot-beds, gun-skids, &c.
- Guarding public property.

TORPEDOES.

- 5 sets torpedoes, complete.
- 150 exercise torpedoes.
- 234 water-caps.
- 288 glands.
- 18 open-end wrenches.
- 276 D. E. fuses.
- 20 dummy-fuses.
- 100 D. E. igniters.
- 48 sample splices.
- 6 galvanometers.

- 576 earth-wires.
- 9 reel-boxes.
- 25 Harvey torpedo-thimbles.
- 24 buoy-ropes.
- 2 torpedo-whips.
- 3 sets torpedo-gear.
- 3 Newell's testing and firing plates.
- 130 packing-boxes for torpedo outfit.
- 100 100-pounder torpedo-spindle covers.
- 41 exercise torpedo-spindle covers.
- 304 saluting-charges.
- 1,681 igniter-wires.
- 270 igniters.
- 21 fuses.
- 288 fuse-igniters.
- 1,102 igniter-plugs.
- 331 fuse-plugs.
- 85 filling-hole plugs.
- 17 station-fuses.
- 24 wire-boxes.
- 2 electric baths.
- 2 electric-bath boxes.
- 1 testing and firing board.
- 60 lead washers.
- 288 service-unions.
- 1 fuse-clamp.
- 135 detonators.
- 90 75-pounder torpedoes.
- 45 battery-zincs.
- 1 battery.
- 2 battery-boxes.
- 304 water-cap castings.
- 1 pump-casting.
- 10 flanges for firing-board.
- 12 safety-lines.
- 1 hand-grenade circuit-closer.
- 53 pounds putty.
- 1 torpedo-socket, wrought iron, experimental.
- 2 Harvey torpedo packing-boxes.
- 400 pounds dynamite.
- 253 pounds dynamite, experimental.
- Making nitro-glycerine.
- Distilling nitric acid.
- Apparatus for instruction.
- Harvey torpedoes for instruction.
- Circuit-closer for instruction.
- Tools.
- Experimental work of all kinds, viz: Explosives; dynamite; nitro-glycerine; McLean's steering-gear; Converse towing-torpedo; Howell torpedo; Lay torpedo; experimental torpedoes; dynamometer; fuses; electric machine; Newell's testing and firing plate; firing-key for hand-grenades; torpedo fittings, &c.
- Repairs to deteriorated stores on hand.
- Repairs to tools, &c.
- Repairs to boats, engines, boilers, &c.
- Repairs to buildings and wharves.
- Guarding public property.

List of vessels for which work has been performed for the year ending June 30, 1879.

Alarm.	Guard.	Nipsic.	Saugus.
Alaska.	Independence.	Omaha.	Shenandoah.
Alert.	Jamestown.	Pensacola.	Supply.
Brooklyn.	Jason.	Plymouth.	Swatara.
Colorado.	Juniata.	Portsmouth.	Tennessee.
Constellation.	Kearsarge.	Powhatan.	Ticonderoga.
Constitution.	Lackawanna.	Quinnebaug.	Vandalia.
Dictator.	Marion.	Richmond.	Wachusett.
Enterprise.	Michigan.	Rio Bravo.	Wyoming.
Galena.	Minnesota.	Saratoga.	Yantic.

FOLGER MERCURIAL.

THE DENSIMETER.

The necessity of an economical, expeditious, and accurate means of determining the specific gravity of gunpowder in grains of considerable size, and in charges greater than are permitted in a system where precision in weighing is essential, has long been felt, and it is with the view of supplying this want that the F. M. densimeter is presented.

In this instrument, the volume of mercury displaced by the sample of powder—or other substance not affected by contact with mercury—is measured by means of the screw with a divided head. The point of the screw is brought in contact successively with the surface of the mercury before and after introduction of the sample whose volume it is desired to measure. The displacement of the screw is measured on a scale, conveniently placed, which is graduated in divisions representing the pitch of the screw. The moment of contact is indicated by the needle of a galvanometer, which, with a single cell, is placed in electric circuit with the screw and cylinder of the densimeter.

The weight of the sample having been previously determined, we then have

$$D = \frac{W}{v} \text{ for the density.}$$

DESCRIPTION.

Fig. 1 represents the instrument. The cylinder, A, is of cast-iron, having the upper portion of its interior bored with considerable accuracy to insure uniformity of diameter.

B, Fig. 2, represents the cage or powder-receptacle. It is supported by three steel rods of a diameter of 3.5 millimeters, which are screwed into the cover, P. The cage, with a capacity of nearly 300 cubic centimeters (to contain about 500 grams of powder), is of thin sheet-iron, pierced with numerous holes for the flow of the mercury.* The powder sample is introduced at a suitable opening provided with a latch-lid at the top of the cage. The cage, being rigidly connected with the cover of the instrument, is secured in place by screwing home the gripe, F. The addition of a little oil renders the thread air-tight. The top of the cover is provided with a glass center, R, in order to observe the surface of the mercury.

J is the exhaust-pipe, which is connected by rubber tubing with the air-pump.

E represents the micrometer-screw; its thread has a pitch of one millimeter. The head of the screw is divided into 100 parts. The bushing, M, is an insulator.

D is a scale of millimeters to facilitate reading the travel of the screw.

K K are screws for leveling the instrument.

L is a guide-fork for centering the cage.

The value of a division of the divided head should first be established, as the thread of the screw cannot be depended upon as measuring a millimeter.

The following test, made at the Naval Experimental Battery, at Annapolis, may serve as an illustration of the method used.

* For fine-grained powder, steel-wire gauze should be substituted.

One hundred cubic centimeters of mercury, measured by accurate weighings, were used in each case.

Date.	Micrometer readings.	Difference.	Temperature.
September 5.....	3739 — 2452	1287	25.5 C.
September 5.....	3740 — 2451	1289	25.5 C.
September 5.....	3740 — 2451	1289	25.5 C.
September 5.....	3734 — 2447	1287	25.5 C.
September 5.....	3735 — 2449	1286	25.5 C.
September 5.....	3736 — 2447	1289	25.5 C.
September 6.....	3754 — 2468	1286	26 C.
September 6.....	3755 — 2465	1290	26 C.
September 6.....	3754 — 2469	1286	26 C.
September 6.....	3756 — 2467	1289	26 C.
Mean		1287.7	

$$\begin{array}{rcl} 100 \log. & 2. & \\ 1287.7 \log. & 3.1098147 & \end{array}$$

$$\text{Log. } k = 8.8901853$$

k = value of each division in cubic centimeters.

$$= 0^{\text{cc}} .07765785$$

This determination once made, K may be regarded as constant within the ordinary range of temperatures.

MODE OF OPERATING THE INSTRUMENT.

Having introduced into the cylinder sufficient mercury to cover the top of the cage, join in circuit, by means of the copper leading-wire, the densimeter, the galvanic cell, and the galvanometer. The wires are attached to the densimeter by the clamps $H H^1$.

Connect the exhaust-pipe with the air-pump by means of the rubber tubing, and exhaust the air until bubbles cease to rise and the manometer-tube shows a vacuum; close the cock S . Turn down the micrometer until the galvanometer indicates the completion of the circuit, and take the reading from the scale and screw-head.

Reverse the screw until the point is beyond the height which will be reached by the mercury when the sample is introduced; relieve the pressure by turning the cock S , and, using care to prevent the loss of mercury clinging to the rods, withdraw the cage until the bottom has cleared the surface of the mercury. Having previously weighed the sample, introduce it into the cage, and proceed as before, exhausting the air, and measuring the height of the mercury with the micrometer.

The difference of readings multiplied by K , the value of a single division, will give the volume (in cubic centimeters) of the sample. Its weight divided by the volume is the density required.

EXAMPLE.—The following experiment made at the experimental battery will illustrate the limits in accuracy which may be anticipated.

A piece of iron of the volume of about 26^{cc} , the density of which had been carefully determined at the Washington navy-yard by means of

the hydrometer to be 7.648, and by the Mallet mercury densimeter to be 7.667, was tested in the F. M. densimeter as follows:

Date.	Micrometer readings.	Difference.	Temperatures.
			°
September 5.....	2448 — 2069 =	379	25.5 C.
September 5.....	2448 — 2070 =	378	25.5 C.
September 5.....	2446 — 2070 =	376	25.5 C.
September 5.....	2447 — 2070 =	377	25.5 C.
September 5.....	2447 — 2069 =	378	25.5 C.
September 6.....	2462 — 2083 =	379	26 C.
		6)2267	
Mean.....		377.833	

log. 2.5772999
K log. 8.8901853

Volume, log. 1.4674852
Weight, 224.85 grains, log. 2.3518929

Density, 7.663, log. .8844077

NOTE.—It may be unnecessary to remark here that the above sample had a volume less than one-tenth the capacity of the cage, and any error in measuring was multiplied by ten when compared with that which may be anticipated with a normal sample.

GENERAL INSTRUCTIONS.

It was found that the contact of the point of the screw and the mercury could be very accurately fixed, and readings of the same volume duplicated, by using the *return* current through the galvanometer-coil, i. e., by "making and breaking" circuit when the point of the screw reaches the surface scum. This point is attained by joining and separating two ends of the wire at each division of the screw-head before contact is reached. In using the direct current, the scum seems to collect at the point, augmenting the reading at each trial.

The mercury should be strained after the instrument has remained unused for any length of time.

All joints should be rendered air-tight when the instrument is closed.

The following accessories, not shown in the plate, are necessary:

A balance-scale sensitive to the half decigramme, with a charge of 500 grammes.

A small galvanometer.

One copper-zinc cell, with 4 feet of copper wire.

A small air-pump, with 4 feet of rubber tubing.

A wire-gauze (spare) cage for fine-grain powders.

W. M. FOLGER,
Lieutenant-Commander, U. S. N.
A. A. MICHELSON,
Master, U. S. N.

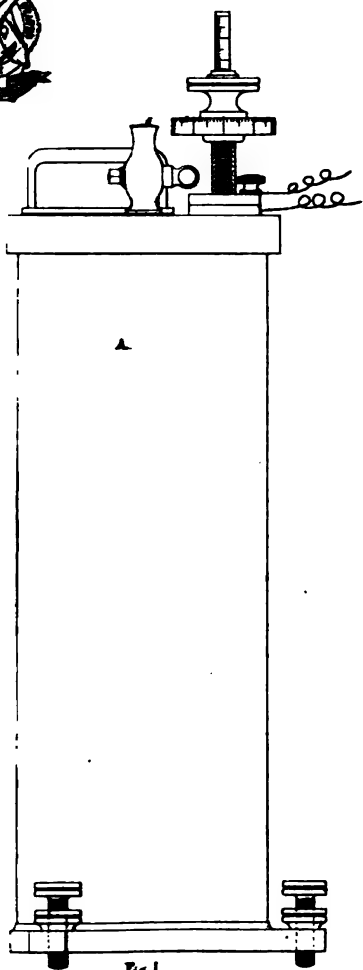


Fig. 1.

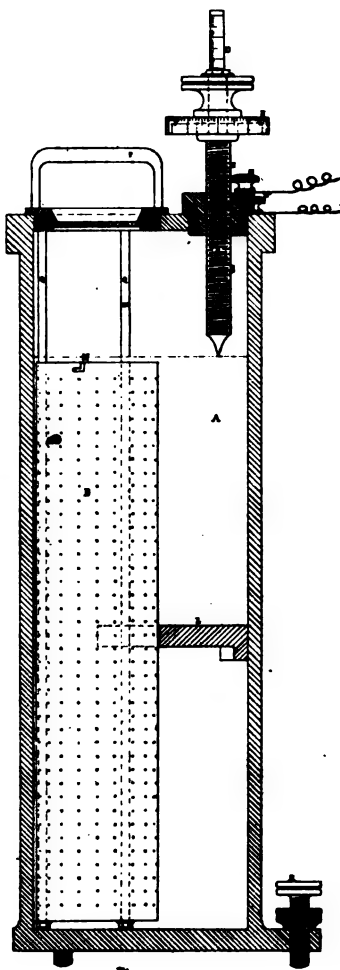


Fig. 2.

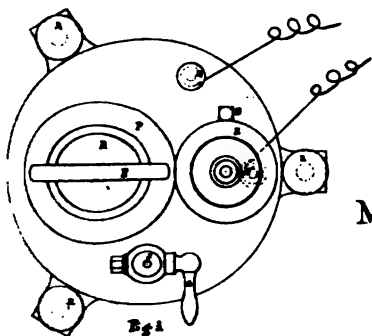


Fig. 3.

Lt Comdr
W.M. FOLGER'S
MERCURIAL DENSIMETER.

F.-M. DENSIMETER.

DESCRIPTION OF INSTRUMENT FOR DETERMINING THE LAW OF RECOIL
OF A GUN AND OF THE MOTION OF A PROJECTILE. By M. SEBERT.

Translated by Master N. SARGENT, U. S. N.

The determination of the exact law of the recoil motion of guns, during the first instants following the ignition of the charge of powder, is of great interest to artillerists, because it can show, under certain conditions, the value of the pressures developed in the bore of the piece, and consequently guide us in the choice of powder calculated to give the most advantageous effects; that is to say, to give the greatest initial velocity of the projectile while developing the smallest pressures in the bore.

Experiments have been made at different times to realize an apparatus of this kind, but the means at disposal, even very lately, for the measurement of phenomena of very short duration did not give the desired precision; it is only by profiting by recent improvements of electrical apparatus, due to Mr. Marcel Deprez, that I have been able to construct an arrangement simple, portable, of comparatively easy working, and capable of furnishing the desired results.

This apparatus, for which I have kept the name of velocimeter, given by Major Rodman to the instrument that he attempted to perfect for the same object, gives, in full size, the exact course of a gun in its movement of recoil, for equally divided intervals of time, whose length in the instrument I have had made has been brought down to $\frac{1}{1000}$ of a second, and could certainly be still further reduced. The instrument tells besides, by the addition of special parts, the exact instant when the projectile leaves the muzzle or is at any other particular part of the bore, and it indicates also the moment that the shot passes through the targets placed in its range; it gives then the length of time the shot takes to leave the bore and the I. V. of the projectile, and can consequently take the place of the chronographs used to measure this velocity.

The apparatus (see fig. below and plate*) for determining the law of recoil is composed of a flexible steel ribbon, A A, of a suitable length, which

* NOTE.—The plate illustrating this article was destroyed by fire in Boston, and cannot be reproduced.

can slide in a horizontal groove, B, mounted on a board, C, which is fixed to a support near the piece. This ribbon is attached to the part of the gun or carriage that we wish to find the recoil of by a steel wire, D, flexible in every direction but not extensible. It is carried along at the time of the recoil of the piece, whose movement it follows, however long it may be; its upper face is covered with lampblack. Above this ribbon is placed a tuning-fork, E, moved electrically by the improved process, due to Mr. Marcel Deprez, a process which gives a considerable breadth of motion and a regular and continuous movement.

One of the prongs of this fork holds a small steel pen, and it is mounted on a horizontal axis which admits of a motion towards or from the ribbon, so that the pen can be brought to touch lightly the blackened surface. As long as the ribbon remains immovable the pen of the tuning-fork only makes a small cross, single mark, caused by the successive vibrations, but if the ribbon is carried along by the piece, the marks corresponding to each vibration become divided and form a sinuous line, which shows by the separation of the successive waves measured on a middle line the travel of the gun for intervals of time exactly equal to the length of vibration of the fork.

The mark is only limited by the length of ribbon used or the distance of the recoil of the carriage.

In reading this mark by means of a micrometer fitted with a microscope, we can construct with great precision a curve which gives the travel of the gun in function of time. If we take the first differences of successive lines of recoil and deduce the successive velocities of recoil of the carriage, and if we take the second differences, we can, knowing the weights of the masses put in motion, and subtracting the passive resistances, deduce for each moment the force applied to the system and, consequently, the pressure exerted at the bottom of the bore.

I can with this instrument, fitted with a tuning-fork giving 1,500 simple vibrations a second, obtain the expression of the law of recoil of the 24 and 14 centimeter naval guns mounted on experimental carriages as well as the law of recoil of the canons de 7.90^m and 138^m of the army mounted on the regulation carriage.

The calculation of the acquired velocities brings out exactly the fact, already noted by the Gâvre Commission, that the velocity of recoil continues to increase sensibly after the projectile has left the bore; an effect which is evidently owing to the expansion of the gases still remaining in the bore after the leaving of the projectile.

For the 24-centimeter gun, for example, throwing with a charge of 28 kilos a projectile of 144 kilo weight, to which it gives a velocity of about 450 meters, we find that the gun and carriage has traversed 30 millimeters, on an average, at the moment when the projectile leaves the bore, that is, at the end of 0.0114 second (about $\frac{1}{88}$ second), that the velocity of recoil is then 3.8 meters, and that it still augments in such a way as to attain a maximum of 5.2 meters, which is produced at the end of an interval of 0.048 second, that is, when the gun in recoiling has traversed about 0.2 meter and when the projectile is already more than 15 meters from the piece.

The indications of the instruments are so exact, that the curve of velocities described shows even the undulating nature of the movement given to the gun and carriage, consequently, doubtless, the elasticity of the pieces composing the system.

The successive velocities obtained form, in effect, a series of undulations, which gradually lessen, and whose period, sufficiently regular, seems to depend on the proper elasticity of the carriage.

To make of this same instrument a chronograph, allowing the measurement of times of flight of projectiles, either in the bore or in the air, it is sufficient to place in the vicinity of the tuning-fork a number of the small electrical registers, of the system invented by Mr. Deprez, in number equal to the number of points we wish to obtain. These registers, "G," are formed of electro-magnets of special construction, whose armatures, held back by a spring, carry a small steel pen, so placed as to trace on the steel ribbon of the velocimeter a continuous line, which is suddenly broken when the armature is put in motion by the breaking of the current which charges the electro-magnet.

By putting one of these registers in communication electrically with an interrupter placed at the muzzle, and which the projectile should cut in leaving the bore, we obtain on the ribbon, carried on at this moment in the recoil motion of the gun, a mark indicating the moment of the passage of the projectile.

Employing two other registers, put in communication in the same manner with the wire targets, placed in the front of the projectile and traversed by electric currents, we determine in the same way the instants of the passing of the projectile through the two targets, and can thus compute the velocity of the projectile.

Although the registers of Mr. Deprez have an extremely rapid motion and a retarding of working reduced to $\frac{1}{75000}$ second, the accuracy required of the instrument does not admit of neglecting this retardation, and as it is slightly variable under the conditions of the experiment (the nature and force of the cells and resistance of the circuits used), it is necessary to determine it exactly in each case.

The instrument is placed so as to give the value by a very simple operation, and if so wished before firing each shot.

To this end, the electric wires encircling each register are reunited on leaving the electro-magnets in a common circuit, which ends in a metallic rule, K, parallel to the slot that guides the ribbon. From this rule and by the intervention of a metallic spring, L, which presses on the rule, the current arrives at a piece, M, attached to the ribbon and sliding on the rule. On this rule besides is cemented a small insulated ivory plate, N. When the gun recoils, carrying with it the ribbon and the movable piece, M, the currents which work the registers, at first established by the contact of the spring and the metallic rule, are simultaneously broken during the very short time of the passage of the spring over the insulated plate, the pens of the registers each mark a small jog, and are then brought back to position at the end of a very short time, when the spring again touches a metallic part. These signals, thus traced by the registers, record the retarding of working for each of the instruments.

We commence in a preliminary experiment by bringing by hand the ribbon and its slide, M, into such a position that the rubbing edge of the spring takes exactly on the line of separation of the insulated plate and the metallic rule; at this moment the metal pens of the registers trace transversal marks which show the exact geometrical position of each of their extremities when the current is broken. If subsequently we repeat the same experiment of breaking the currents whilst moving the ribbon rapidly, it is evident that we shall obtain other points whose marks will coincide with the first only if the retardation of the registers is absolutely nothing, for if otherwise, the pens will have traversed a certain space between the moment of breaking the current, consequent on the passage of the spring over the insulated plate, and the one when they will start to move, and consequently between the moment of attain-

ing the position of their first marks and the one when they produce new ones.

In practice, as it is impossible to perfect the construction of a register whose retardation of working will be *nil*, this effect is always produced, and we observe an appreciable distance between the marks made in the first experiment and those obtained in the rapid movement of the ribbon. This distance represents a time which it is easy to value, since the marks left on the ribbon by the pen of the tuning-fork show the intervals of time corresponding to each linear displacement of the instrument.

The slowness or retardation in working that we have mentioned is owing in part to the slowness of demagnetization of the electro-magnets, and, besides, to the retardation of the putting in motion of the mechanical parts which hold the pens; it is the sum of these two retardations and can be called the "retardation of disjunction." With the manner of working, as shown above, we must take account of another retardation due to the time necessary to put in motion the pens of the registers when the current is re-established. This delay, which can be called the "retardation of junction," is composed of the retardation of magnetization, always in a marked degree greater than the retardation of demagnetization, and also, as before, of the delay of putting in motion the mechanical parts that operate the pen.

At the time of firing, the registers are first magnetized and the pens each trace a line of a certain length before the spring reaches the insulated plates; at the instant it gets to that point the pens mark the lines of "disjunction"; they remain disjoined so long as the spring bears on the insulated part; at the moment the registers are repolarized automatically, which is when the current is re-established, the pens mark their lines of "junction"; they must have entirely resumed their first position before the projectile encounters the first of the interrupters placed in its path. If this first interrupter is, for example, placed at the muzzle, we see that the sum of the retardations of working of the corresponding registers, that is, the sum of the "retardation of disjunction" and of the "retardation of junction," increased by the length of interruption of the current, due to the passage of the spring over the insulated plate, should be less than the time of flight in the bore.

This time of flight, in a field-piece, can be very little more than $\frac{1}{25}$ second; we see how fast the registers should work, so as to have time to give the first notification of their retardation, and to be ready to work anew to signal the passage of the projectile.

The registers of the Deprez system satisfy this condition; they can be operated with such rapidity of motion that if placed in the circuit of a fork worked electrically and giving 1,000 vibrations a second, they can indicate each of the 500 breakings and 500 closings of signals made per second by this fork, and show, by the lines obtained, that their armatures have yet time to remain at rest during an appreciable space of time between each of the thousand beats.

But we can also employ, with the velocimeter, less perfect registers and not impose on them the duty of furnishing lines to measure the retardations during the recoil of the piece. We can, in effect, draw the ribbon by hand with a sufficient velocity, in a preliminary experiment, whilst making the fork vibrate. We thus get lines containing the necessary elements for the determination of the retardations of disjunction, and we can then, in firing, avoid the mechanical and simultaneous breaking of the currents.

In this case we attach the return wire to the target post, which is seen

to the left of the groove near the end of the board, and thus avoid having the current pass by the spring.

The registers remain then constantly polarized until the instant they should give their respective signals, and it is not necessary to consider the necessity of not making the first signal until after a sufficient time for the registers to have worked once, and have retaken their waiting position. We can even use registers which do not polarize automatically, a kind that is much easier to make and use.

The separation of the successive signals of the registers is read by a micrometer, which also serves to read the mark of the fork; at the same time we count the number of vibrations of the fork comprised in the interval, and measure the length of the extreme vibrations, which correspond to the signals, so as to take into consideration the fractions of these vibrations. We thus determine the times corresponding to the different signals of the registers, and take away the proper retardation for each one of them. The instrument allows easily the appreciation of the .00001 second, but the variations of the retardations of the registers being able to attain .00050 second, we can only in reality depend on an approximation superior to this last value.

In the experiment made with the 24-centimeter gun, 1870 model, we obtained the following results:

Length of flight of projectile in the bore, 0.01124 second; time of flight from the muzzle to the first target, placed at a distance of 33 meters, 0.07305 second; time of flight from first to second target placed 83 meters from the piece, 0.1127 second.

We deduce from these values that the velocity of projectile was, at 16 meters from the muzzle, 451.2 meters, and at 78 meters, 443.2 meters. The instrument can evidently serve to study the law of motion of any body which receives a sudden impulse. We shall be able to apply it, for example, to the determination of the law of the motion of a spring suddenly liberated, to the investigation of the law of motion of a gas-machine thrown forward by the action of a detonating mixture, to that of the action of a trip-hammer; it could also be used to investigate the movements caused by animate objects, and it easily admits, for example, the expression of the law of motion that a man impresses on the ribbon in rubbing his hand briskly over it.

I have recently applied this same instrument to the investigation of the law of motion of an hermetically jointed piston, penetrating in a cylindrical pump filled with air by the action of the shock given by a falling weight.

Instruments recently constructed, in view of the determination of pressures developed in the bore of a piece during the firing, allow, in this same experiment, the determination at each instant of the pressure developed by the compression of the air; we can, therefore, by combining these two instruments, determine simultaneously the volume to which the air is reduced at each instant, and the corresponding instantaneous pressure; this is a result which seems to me to be of some importance so far as the proving of some of the theories of the mechanical laws of heat and the investigation of the laws of loss of heat by metallic surroundings, and I allow myself to call to it the attention of the physicists who are specially interested in these questions.

NOTE.—The plate intended to be inserted on this page was destroyed by fire in Boston, and cannot be reproduced.

UNITED STATES TORPEDO STATION,
Newport, R. I., May 20, 1879,

ASSIGNMENT OF OFFICERS OF THE STATION.

Capt. F. M. Ramsay, inspector of ordnance, in charge of station.

Lieut. Commander C. F. Goodrich, assistant inspector of ordnance, instructor in defensive torpedoes, fuzes, and diving.

Lieut. J. S. Newell, assistant inspector of ordnance, instructor in offensive torpedoes.

Lieut. W. Maynard, assistant inspector of ordnance, instructor in electricity.

Gunner W. Burditt, in charge of shops.

Mr. W. N. Hill, chemist, instructor in chemistry and explosives.

Prof. M. G. Farmer, electrician.

COURSE OF INSTRUCTION.

The course will embrace the months of June, July, and August.

The attendance of officers for instruction will be from the 9.30 a. m. to the 2.20 p. m. boat.

The day will be divided into two periods.

First period from 9.45 a. m. to 11.45 a. m.

Second period from 12.15 p. m. to 2.15 p. m.

The lectures and practical exercises will be as per schedule, which will be posted daily in the officers' room and in the ferry launch.

The officers under instruction will have ready each Monday morning, for the examination of the commanding officer, a carefully and neatly written *résumé* of the lectures of the previous week, giving detailed drawings, descriptions, and explanations of such things as may be specially designated by the instructors. Blank-books will be furnished for this purpose. These books will be examined by the instructors, who will note all errors and return the books to the commanding officer.

As a general rule, for practical exercises, the officers under instruction will be divided into three parts.

At the close of the course an examination will take place before a board of visitors, to whom the books of the officers under instruction will be submitted.

Instruction in diving and submarine work connected with torpedoes will be given to such officers as may desire it.

The officers in attendance at the course of instruction are notified that the course will embrace the months of June, July, and August.

The periods of instruction will be from 9.45 a. m. to 11.45 a. m. and from 12.15 p. m. to 2.15 p. m. daily, except Saturdays.

The lectures and practical exercises will be as per schedule, which will be posted daily in the officers' room and in the ferry launch.

Books similar to those issued to the officers under instruction will be issued to the officers in attendance for their personal use, and, if desired, the instructors will gladly correct any errors or omissions that may be made in them.

Proposed schedule of lectures and practical exercises.

Date.	Day.	A. M. Period.	P. M. Period.
June 4	Wednesday	Offensive torpedoes	Offensive torpedoes.
5	Thursday	do	Electricity.
6	Friday	Electricity	
9	Monday	Explosives	Explosives.
10	Tuesday	Offensive torpedoes	Offensive torpedoes.
11	Wednesday	Electricity	Electricity.
12	Thursday	Practical exercises	Practical exercises.
13	Friday	do	
16	Monday	Offensive torpedoes	Electricity.
17	Tuesday	Electricity	Explosives.
18	Wednesday	Explosives	Do.
19	Thursday	Electricity	Electricity.
20	Friday	do	
23	Monday	Chemistry	Offensive torpedoes.
24	Tuesday	Offensive torpedoes	Do.
25	Wednesday	Electricity	Do.
26	Thursday	Practical exercises	Practical exercises.
27	Friday	do	
30	Monday	Electricity	Electricity.
July 1	Tuesday	Explosives	Explosives.
2	Wednesday	do	Do.
3	Thursday	Practical exercises	Practical exercises.
7	Monday	Offensive torpedoes	Offensive torpedoes.
8	Tuesday	Explosives	Electricity.
9	Wednesday	Electricity	Do.
10	Thursday	Practical exercises	Practical exercises.
11	Friday	do	
14	Monday	Explosives	Explosives.
15	Tuesday	Offensive torpedoes	Electricity.
16	Wednesday	Electricity	Do.
17	Thursday	Practical exercises	Practical exercises.
18	Friday	do	
21	Monday	Explosives	Offensive torpedoes.
22	Tuesday	Offensive torpedoes	Explosives.
23	Wednesday	Electricity	Electricity.
24	Thursday	Practical exercises	Practical exercises.
25	Friday	do	
28	Monday	Offensive torpedoes	Offensive torpedoes.
29	Tuesday	Electricity	Chemistry.
30	Wednesday	do	Offensive torpedoes.
31	Thursday	Practical exercises	Practical exercises.
Aug. 1	Friday	do	
4	Monday	Offensive torpedoes	Offensive torpedoes.
5	Tuesday	Chemistry	Chemistry.
6	Wednesday	Defensive torpedoes.	Defensive torpedoes.
7	Thursday	Practical exercises	Practical exercises.
8	Friday	do	
11	Monday	Defensive torpedoes.	Electricity.
12	Tuesday	Offensive torpedoes.	Offensive torpedoes.
13	Wednesday	do	Electricity.
14	Thursday	Defensive torpedoes.	Defensive torpedoes.
15	Friday	Practical exercises	
18	Monday	Defensive torpedoes.	Offensive torpedoes.
19	Tuesday	Offensive torpedoes.	Chemistry.
20	Wednesday	Defensive torpedoes.	Defensive torpedoes.
21	Thursday	do	Offensive torpedoes.
22	Friday	Practical exercises	
25	Monday	Practical exercises and reviews	
26	Tuesday		
27	Wednesday		
28	Thursday		
29	Friday		

PROPOSED LECTURES ON OFFENSIVE TORPEDOES.

1. Service spar-torpedo—description, construction, explosives, method of filling. (Illustrated by the assembling of parts.)
2. Service spar-torpedo—description of sockets, spars, cables, and wires—method of lashing socket to spar and of securing torpedo to spar—splicing cables—insulating—fusing. (Illustrated by lashing a socket to a spar, securing a torpedo to a spar, splicing, insulating, fusing.)
3. Service spar-torpedo—method of firing, using "C" machine—methods that have been used. (Illustrated by firing with a "C" machine, a

fuse in a torpedo, and showing how the cotton cover of spindle is perforated.)

4. Service launch fittings. (Illustrated by placing fittings on a launch, rigging spar, filling, fusing, and firing a torpedo.)

5. Proposed method of fitting launches for torpedoes.

6. Foreign spar-torpedoes and launch fittings.

7. Service spar-torpedoes—tug fittings—proposed plans—foreign tug or gunboat fittings.

8, 9. Service spar-torpedo ship fittings—proposed changes.

8, 9. Foreign ship fittings. (Illustrated by firing igniters with the different apparatus, and by placing fittings and firing torpedo from Nina.)

10. Service spar-torpedo—monitor fittings—exercise torpedoes.

11. Service spar-torpedo—outfits—improvised torpedoes.

12. Faults that may occur in "A" and "C" machines, firing-key, firing-plate, and firing-board.

13. Short history of spar-torpedoes.

14. Harvey towing torpedo—description.

15. Harvey towing torpedo—manner of using. (Illustrated by preparing, rigging, and towing Harvey from Nina.)

16, 17. Other towing torpedoes, and history of towing torpedoes.

18. Mechanically-controlled torpedoes—Lay's and Hardy's. (Illustrated by working the Lay boat.)

19. Mechanically-controlled torpedoes—Ericsson's and Sim's.

20. Mechanically-controlled launches. (Illustrated by working the Success.)

21. Automatic torpedoes—Howell's, Station Fish, Whitehead's, and others.

22. Automatic torpedoes—rocket and drifting.

23. Hand grenades and submarine guns. (Illustrated by using hand grenades.)

24. Torpedo boats and vessels.

25. Mode of attack with, and defense against, different torpedoes.

26. Methods of clearing channels and removing obstructions.

PROPOSED PRACTICAL EXERCISES.

Fill fuse and fire a 75-pounder torpedo from a launch.

Fire igniters with different apparatus.

Fill fuse and fire a 100-pounder torpedo from the Nina.

Improvise and fire torpedoes.

Detect and correct faults in machines, cables, &c.

Use Harvey towing torpedo against a vessel at anchor.

Use Harvey towing torpedo against a vessel under-way.

Work Lay torpedo boat.

Work Success as a mechanically-controlled launch.

PROPOSED LECTURES ON DEFENSIVE TORPEDOES.

1. Defensive torpedoes, description of different kinds used or known.

2. Defensive torpedoes, description of different kinds used or known.

3. Defensive torpedoes, description of different kinds used or known.

4. Defensive torpedoes—methods of handling, planting, mooring, and taking up—rules to be observed.

5. Defensive torpedoes—depths at which effective, and radius of destructive effect, with different charges—description of station circuit

closer, and of Converse indicator, with necessary arrangement of batteries, &c., for use with them.

6. Defensive torpedoes—description of electrical apparatus that may be used with—description of all known serviceable circuit closers, breakers, and indicators, with necessary arrangement of batteries, &c., for use with them.

7. Defensive torpedoes—improvised.

8. Defense of harbors and channels—methods of planting torpedoes, arrangement of cables and apparatus—methods of determining the position of a vessel with reference to any torpedo in a defensive system.

9. Electric lights—description of different kinds—relative merits—most effective way of lighting harbors and channels for either offensive or defensive purposes.

PROPOSED PRACTICAL EXERCISES.

Make service D. E. igniters.

Make service D. E. fuses.

Make M. E. igniters.

Make F. igniters.

Make improvised fuse, Moore's.

Make improvised fuse, Pillsbury's.

Detect and correct faults in fuses.

Plant improvised defensive torpedoes, connect with, and show working of Converse indicator.

PROPOSED LECTURES ON ELECTRICITY.

1. Effects which can be produced by—chemical—thermal—magnetic—which useful in torpedo work—how—why. Technical terms in common use.

2. Properties of conductors—strength of current—meaning of—strength of current, what determined by—laws of currents—ohms—Joule's—Kirchoff's, &c.—division of currents—simple and branch circuits—Gavaret's formulæ.

3. Resistance—laws of—tables of—how made—how use—effects of temperature upon resistance.

4. Different means of producing electricity—magnets and magnetism—explanation of—relation of magnetism to electricity—Ampère's theory—magnetic effects of currents—magnetic field—explanation of.

5. Induction—meaning and explanation of—induction, laws of—magneto-electric induction—explanation of—magneto-electric induction machines.

6. Farmers' "A" machine—description of all its parts and appendages—difference between "A" and "C" machines.

7, 8, 9. Galvanic batteries—description and explanation of most useful forms—description of all known forms of—merits and defects of different batteries—theory of the galvanic cell—care of batteries—sources of waste—relative expense—how to arrange batteries for particular effects.

10. Electrical measurements—nomenclature used—electrical units in common use—their derivation and interdependence—resistance coils or rheostats.

11, 12. Strength of current—measurement of—by the voltameter—by amount of heat produced—by the galvanometer—and full explanation of the galvanometer, its various forms and uses, and the use of "shunts" with it. The electro-dynamometer, explanation of its principle.

13. Resistance other than battery and insulative—measurement of—measurement of by substitution, by comparison, by Wheatstone's bridge.

14, 15. Battery measurements.

16. Laws of electro-magnetism—influence of.

16. Strength of current—influence of number of turns of wire—influence of length and diameter of core—influence of position of coil on core—conditions of maximum lifting power—dimensions of coils—how calculated.

17, 18. Influence of wire on field and armature—description of other magneto-electric machines, with permanent field with steel magnets—with temporary field with electro-magnets—comparison of different magneto-electric machines.

19. Description of frictional machines—conditions necessary for their successful use.

20. General principle of construction of electric igniters—conditions to be fulfilled—various materials for bridges—the best—others compared—bearing of Joule's law—methods of determining availability of unknown material for use in igniters—igniters best suited for different machines—their merits and defects—igniters best suited for batteries.

21. Conditions to be fulfilled by electricity in torpedo work—comparative value of various sources of electricity for torpedo work.

22. Relays simple and polarized—principle and general construction of—electric bells—different kinds—circuit-closers for—wire for—manner of putting up for ordinary use and for repeating—thermostats—description of different kinds—manner of putting up—how operated.

23. Electrical apparatus of the Trenton—description of.

24. Insulators—dielectrics—condensers—how made, &c.—mirror-galvanometer—measurement of insulative resistance.

PRACTICAL WORK—ELECTRICITY.

1. Calculation of resistance from dimensions and material of conductors.
2. Calculation of resistance of branch circuits, and of strength of current in simple and branch circuits.

3. Setting up batteries.

4. Calculation of number and arrangement of battery-cells necessary to do certain work.

5. Measurement of strength of current by tangent galvanometer.

6. Calculation of resistance of shunts of any multiplying power for particular galvanometers.

7. Measurements of resistance by the various methods.

8. Measurement of the electro-motive force and internal resistance of batteries.

9. Measurement of machines.

10. Measurement of strength of current required to do certain work.

11. Determination of the suitability of unknown material for the bridge of an igniter.

12. Measurement of insulation resistance.

PROPOSED LECTURES ON EXPLOSIVES AND IN CHEMISTRY.

1. Explosive reactions. (General.)

2. General composition of explosive bodies—classification, nitrate mixtures.

3. Gunpowder.

4. Gunpowder.

5. Gunpowder.

6. Electrical chemistry.
7. Nitro-glycerine.
8. Dynamite (including all nitro-glycerine compounds).
9. Dynamite (including all nitro-glycerine compounds).
10. Gun-cotton.
11. Picrates and picric powder.
12. Fulminating mercury.
13. Chlorate mixtures. Fuse compositions.
14. Other explosives.
15. Comparative effect of explosives. Explosive agents in torpedoes.
16. Propulsion of automatic torpedoes—manufacture and use of liquid carbonic acid for, &c.
17. Metals—metallurgy of iron.
18. Metals—metallurgy of iron.
19. Metallurgy of metals other than iron.

PROPOSED PRACTICAL EXERCISES.

Manufacture of nitro-glycerine and dynamite.
Respectfully submitted.

F. M. RAMSAY,
Captain and Inspector of Ordnance in charge of Station.

Approved:

R. W. THOMPSON,
Secretary of the Navy.

No. 35.]

UNITED STATES TORPEDO STATION,
NEWPORT, R. I., *September 4, 1879.*

COMMODORE: I have the honor to report that the course of instruction for officers commenced on the 4th day of June, and was completed on the 29th ultimo.

The attendance of officers for instruction was required from 9.40 a. m. to 2.20 p. m., each day, except Saturday.

The day was divided into two periods:

First period, 9.45 a. m. to 11.45 a. m.

Second period, 12.15 p. m. to 2.15 p. m.

The lectures were delivered to the class as a whole, but for practical work the class was divided into three parts.

The officers under instruction were required to hand to the commanding officer each Monday morning a carefully written *résumé* of the lectures of the previous week. Each officer was also required to write his views on the "Defense of a ship against torpedoes," and submit them on the 25th of August.

DUTIES OF OFFICERS OF THE STATION.

Lieut. Commander C. F. Goodrich, assistant inspector of ordnance, instructor in defensive torpedoes, fuses, and diving.

Lieut. J. S. Newell, assistant inspector of ordnance, instructor in offensive torpedoes.

Lieut. W. Maynard, assistant inspector of ordnance, instructor in electricity.

Gunner W. Burditt, in charge of shops.

Mr. W. N. Hill, chemist, instructor in chemistry and explosives.

Prof. M. G. Farmer, electrician.

COURSE OF INSTRUCTION.

In offensive torpedoes.

Lecture 1.—The service spar-torpedo; its construction; explosives used with it; manner of filling; torpedo sockets.

Lecture 2.—Spars, cables, wires, splicing, and manner of fusing service spar-torpedo.

Lecture 3.—Manner of firing service spar-torpedo; use of "C" machine; other plans for causing explosions.

Lecture 4.—Service launch torpedo-fittings—Converse's improved plan of same.

Lecture 5.—Modifications as proposed by Lieutenants Converse and Newell—comparison of bow and beam plans.

Lecture 6.—Foreign plans of spar torpedo-fittings for boats.

Lecture 7.—Service tug-fittings; proposed plans, and foreign tug and gunboat fittings for use of spar ahead.

Lectures 8, 9.—Danish beam-fittings for gunboats. Service ship-fittings.

Lecture 10.—Proposed changes in ship's fittings: Foreign ship-fittings, monitor service-fittings—exercise-torpedoes.

Lectures 11, 12, 13.—"Torpedo instructions." Torpedo outfits. Improved torpedoes. Manner of detecting faults liable to occur in "A" machine, "C" machine, and the firing-key. History of spar-torpedoes and circuit-closers for the spar-torpedo.

Lectures 14, 15.—Towing-torpedoes—Harvey torpedo.

Lectures 16, 17.—Towing-torpedoes—Porter's, Matthew's, Converse's, Barber's, Maynard's, and foreign, French, and Danish, with a history of the towing-torpedo.

Lectures 18, 19, 20.—Mechanically-controlled torpedoes—Lay's, Hardy's, Ericsson's, and Sims'.

Lectures 21, 22, 23.—Mechanically-controlled boats—McLean's, Converse—experiments of 1878 and English plan. Automatically-controlled torpedoes—Howell, Station, Fish, Knapp, and Whitehead.

Lecture 24.—Lieutenant Pillsbury's plan for automatically controlling a torpedo. Rocket and drifting torpedoes and submarine guns.

Lectures 25, 26.—Attack with and defense from offensive torpedoes. Hand grenades—Newell's, Elmer's, and English. Submarine boats.

Lectures 27, 28.—Torpedo-boats and fast launches.

Lectures 29, 30, 31.—Clearing channels, removal of obstructions, effect of nets on contact-mines, breaking chains, &c.

Practical work.

Three periods.—Filling, fusing, and firing 75-pounder torpedoes from a launch.

Three periods.—Firing igniters with different apparatus.

Three periods.—Filling, fusing, and firing 100-pounder torpedoes from a launch.

Three periods.—Improvising and firing torpedoes.

Three periods.—Detecting and correcting faults in machines, cables, &c.

Three periods.—Using Harvey towing-torpedo against vessel at anchor and under way.

Three periods.—Using testing and firing plates, and testing and firing boards with ship-fittings.

In defensive torpedoes.

Lectures 1, 2, 3.—Descriptions of different kinds of defensive torpedoes.

Lecture 4.—Methods of handling, planting, mooring, and taking up defensive torpedoes, with rules to be observed.

Lecture 5.—Depths at which torpedoes are effective, and radius of destructive effect, with different charges. Description of station circuit-closer and Converse indicator, with necessary arrangement of batteries for use with them.

Lecture 6.—Electrical apparatus that may be used with defensive torpedoes—circuit-closers, breakers, and indicators.

Lecture 7.—Improvised defensive torpedoes.

Lecture 8.—Methods of defending harbors and channels with torpedoes—methods of determining the position of a vessel with reference to any torpedo in a defensive system.

Lecture 9.—Electric lights—most effective way of lighting harbors and channels for either offensive or defensive purposes.

Practical work.

Six periods.—Manufacturing D. E. igniters.

Six periods.—Manufacturing D. E. fuses.

Three periods.—Manufacturing M. E. igniters and F. igniters.

Three periods.—Improvising fuses.

Three periods.—Detecting and correcting faults in igniters and fuses.

In electricity.

Lecture 1.—Effects which can be produced by electricity—chemical—thermal—magnetic electricity—which useful in torpedo work—how—why—technical terms in common use.

Lecture 2.—Properties of conductors—strength of current—meaning of and what determined by—laws of currents—ohms—Joule's—Kirchoff's, &c.—division of currents—simple and branch circuits—Gavarett's formula.

Lecture 3.—Resistance—laws of—tables of—how made—how used—effects of temperature on resistance.

Lecture 4.—Different means of producing electricity—magnets and magnetism—explanation of—relation of magnetism to electricity—Ampère's theory—magnetic effects of currents—magnetic field—explanation of.

Lecture 5.—Induction—meaning and explanation of—induction, laws of—magneto-electric induction, explanation of—magneto-electric induction machines.

Lecture 6.—Farmer's A machine—description of all its parts and appendages—difference between A and O machines.

Lectures 7, 8, 9.—Galvanic batteries—description and explanation of most useful forms—description of all known forms of—merits and defects of different batteries—theory of the galvanic cell—care of batteries—sources of waste—relative expense—how to arrange batteries for particular effects.

Lecture 10.—Electrical measurements—nomenclature used—electrical units in common use—their derivation and interdependence—resistance coils, or rheostats.

Lectures 11, 12.—Strength of current—measurement of by the voltmeter—by amount of heat produced—by the galvanometer—and full ex-

planation of the galvanometer, its various forms and uses, and the use of "shunts" with it—the electro-dynamometer—explanation of its principle.

Lecture 13.—Resistance other than battery and insulation—measurement of—measurement of by substitution, by comparison, by Wheatstone's bridge.

Lectures 14, 15.—Battery measurements.

Lecture 16.—Laws of electro-magnetism—influence of strength of current—influence of number of turns of wire—influence of length and diameter of core—influence of position of coil on core—conditions of maximum lifting-power—dimensions of coils, how calculated.

Lectures 17, 18.—Influence of wire on field and armature—description of other magneto-electric machines, with permanent field, with steel magnets; with temporary field, with electro-magnets—comparison of different magneto-electric machines.

Lecture 19.—General principle of construction of electric igniters—conditions to be fulfilled—various materials for bridges; the best; others compared—bearing of Joule's law—methods of determining availability of unknown material for use in igniters—igniters best suited for different machines; their merits and defects—igniters best suited for batteries.

Lecture 20.—Description of frictional machines—conditions necessary for their successful use.

Lecture 21.—Insulators—dielectrics—condensers, how made, &c.—mirror galvanometer—measurement of insulative resistance.

Lecture 22.—Relays, simple and polarized, principle and general construction of—electric bells; different kinds; circuit-closers for; wire for; manner of putting up for ordinary use and for repeating—thermostats; description of different kinds; manner of putting up; how operated.

Lecture 23.—Conditions to be fulfilled by electricity in torpedo work—comparative value of various sources of electricity for torpedo work.

Lecture 24.—Electrical apparatus of Trenton; description of.

Practical work.

Three periods.—Calculation of resistance from dimensions and material of conductors—calculation of resistance of branch circuits, and of strength of current in simple and branch circuits.

Three periods.—Setting up batteries.

Three periods.—Calculation of number and arrangement of battery cells to do certain work.

Three periods.—Measurement of strength of current by tangent galvanometer—calculation of resistance of shunts of any multiplying power for particular galvanometers—measurements of resistance by the various methods.

Three periods.—Measurement of the electro-motive force and internal resistance of batteries—measurement of machines—measurement of strength of current required to do certain work.

Three periods.—Determination of the suitability of unknown material for the bridge of an igniter.

Three periods.—Measurement of insulation resistance.

In explosives and in chemistry.

Lecture 1.—Explosive reactions. (General.)

Lecture 2.—General composition of explosive bodies. Classification. Nitrate mixtures.

Lectures 3, 4, 5.—Gunpowder.

Lecture 6.—Electrical chemistry.

Lectures 7, 8.—Nitro-glycerine.

Lectures 9, 10.—Dynamite (including all N. G. preparations).

Lecture 11.—Gun-cotton.

Lecture 12.—Fulminating mercury.

Lecture 13.—Picrates and picric powder.

Lecture 14.—Chlorate mixtures. Fuse compositions.

Lecture 15.—Other explosives.

Lecture 16.—Comparative effect of explosives. Explosive agents in torpedoes.

Lecture 17.—Propulsion of automatic torpedoes. Manufacture and use of liquid carbonic acid for, &c.

Lectures 18, 19.—Metals. Metallurgy of iron.

Lecture 20.—Metallurgy of metals other than iron.

Lecture 21.—Water.

Practical work.

Two periods.—Manufacture of nitro-glycerine and dynamite.

Schedule of lectures and practical work.

Date.	Day.	A. M. Period.	P. M. Period.
June 4	Wednesday	Offensive torpedoes	Offensive torpedoes.
5	Thursday	do	Electricity.
6	Friday	Electricity	Explosives.
9	Monday	Explosives	Offensive torpedoes.
10	Tuesday	Offensive torpedoes	Electricity.
11	Wednesday	Electricity	Practical work.
12	Thursday	Practical work	do
13	Friday	do	Electricity.
16	Monday	Offensive torpedoes	Explosives.
17	Tuesday	Electricity	do
18	Wednesday	Explosives	Electricity.
19	Thursday	Electricity	do
20	Friday	do	Offensive torpedoes.
23	Monday	Chemistry	do
24	Tuesday	Offensive torpedoes	do
25	Wednesday	Electricity	Practical work.
26	Thursday	Practical work	do
27	Friday	do	Electricity.
July 1	Monday	Electricity	Explosives.
2	Tuesday	Explosives	do
3	Wednesday	do	Practical work.
4	Thursday	Practical work	Offensive torpedoes.
7	Monday	Offensive torpedoes	Electricity.
8	Tuesday	Explosives	do
9	Wednesday	Electricity	Practical work.
10	Thursday	Practical work	do
11	Friday	do	Explosives.
14	Monday	Explosives	Electricity.
15	Tuesday	Offensive torpedoes	do
16	Wednesday	Electricity	Practical work.
17	Thursday	Practical work	do
18	Friday	do	Explosives.
21	Monday	Explosives	Electricity.
22	Tuesday	Offensive torpedoes	do
23	Wednesday	Explosives	Practical work.
24	Thursday	Practical work	do
25	Friday	do	Offensive torpedoes.
28	Monday	Offensive torpedoes	Electricity.
29	Tuesday	Electricity	Chemistry.
30	Wednesday	do	Practical work.
31	Thursday	Practical work	do
Aug. 1	Friday	do	Offensive torpedoes.
4	Monday	Offensive torpedoes	Defensive torpedoes.
5	Tuesday	do	do
6	Wednesday	Defensive torpedoes.	Practical work.
7	Thursday	Practical work	do
8	Friday	do	Offensive torpedoes.
11	Monday	Electricity	do
12	Tuesday	Offensive torpedoes	

Schedule of lectures and practical work—Continued.

Date.	Day.	A. M. Period.	P. M. Period.
Aug. 13	Wednesday	Electricity	Defensive torpedoes.
14	Thursday	Defensive torpedoes	Do.
15	Friday	Offensive torpedoes	
18	Monday	do	Offensive torpedoes.
19	Tuesday	Defensive torpedoes	Defensive torpedoes.
20	Wednesday	do	Offensive torpedoes.
21	Thursday	Chemistry	Chemistry.
22	Friday	Offensive torpedoes	
25	Monday	do	Offensive torpedoes.
26	Tuesday	Chemistry	Chemistry.
27	Wednesday	Offensive torpedoes	Offensive torpedoes.
28	Thursday	Chemistry	Chemistry.

OFFICERS IN ATTENDANCE ON THE COURSE OF INSTRUCTION.

Commanders A. Hopkins, U. S. N.; T. F. Kane, U. S. N.; James O'Kane, U. S. N.; H. B. Robeson, U. S. N.; C. McGregor, U. S. N.; Capt. James Forney, U. S. M. C.

OFFICERS UNDER INSTRUCTION.

Lieut. Commanders A. H. Wright, U. S. N.; and A. G. Caldwell, U. S. N.; Lieuts. G. C. Reiter, U. S. N.; W. W. Mead, U. S. N.; S. Bellden, U. S. N.; W. W. Gilpatrick, U. S. N.; C. P. Shaw, U. S. N.; J. K. Cogswell, U. S. N.; G. B. Harber, U. S. N.; H. O. Handy, U. S. N.; J. C. Wilson, U. S. N.; W. A. Hadden, U. S. N.; H. T. Stockton, U. S. N.; Master F. S. Hotchkiss, U. S. N.

The examination before the Board of Visitors, consisting of Commodore George M. Ransom, U. S. N.; Capt. S. R. Franklin, U. S. N.; Capt. George E. Belknap, U. S. N.; Lieut. Commander W. C. Wise, U. S. N.; commenced on the 2d instant, and closed this day.

Respectfully, your obedient servant,

F. M. RAMSAY,

Captain, and Inspector of Ordnance, in charge of Station.

Commodore W. N. JEFFERS, U. S. N.,

Chief of Bureau of Ordnance,

Navy Department, Washington, D. C.

UNITED STATES TORPEDO STATION,
Newport, R. I., September 5, 1879.

SIR: In obedience to orders of the department of the 8th ultimo, designating the undersigned as a board to witness the examination of officers under instruction in the manufacture and use of torpedoes at this station, the board has the honor to report to you that it convened for that purpose on the 2d instant, and respectfully submits, for your consideration, the points by which it was chiefly impressed, in the process of what it had the gratification to witness.

By the test of proficiency observed here, in the practical application of knowledge acquired under its teachings, it is satisfactorily demonstrated to the board that the very high degree of interest and importance attaching to this institution and its purposes are not in the least measure misplaced nor its merits overrated.

The constant changes occurring in torpedo science renders it impor-

tant that the yearly appropriation for this institution should be considerably increased, with a view to experimenting and to keeping the station supplied with torpedo boats of high speed and efficiency.

The library is not in keeping with the importance and demands of the school, and the board recommends that sufficient funds be allowed to supply all books, periodicals, and other publications pertaining to torpedo service and instructions, as soon as published. The importance of the latest literature for the use of the students cannot be overestimated.

The board was much pleased with the very creditable exhibition of the steam-launch *Success*, controlled by Lient. J. S. Newell from the shore with electrical mechanism, starting, stopping, turning, reversing the engine and backing, firing torpedoes, countermining, using the helm, &c.

Much gratification was felt at the perfect and thorough recitations in the several branches pursued at the school; the answers were quick, clear, and exhaustive, indicative of thorough methods of instruction and earnest diligence on the part of the student.

The board earnestly commends Capt. F. M. Ramsay for his zeal and conspicuous ability, as exemplified in the splendid order, neatness, and thorough efficiency everywhere and in everything about the station under his command.

The undersigned have the honor to be, sir, very respectfully, your obedient servants,

GEO. M. RANSOM,
Commodore, U. S. N., and President of Board.
S. R. FRANKLIN,
Captain, U. S. N., member.
GEO. E. BELKNAP,
Captain, U. S. N., member.
W. C. WEST,
Lieutenant-Commander and member.

Commodore WM. N. JEFFERS, U. S. N.,
Chief of Bureau of Ordnance,
Navy Department, Washington, D. C.

UNITED STATES TORPEDO STATION,
Newport, R. I., September 9, 1879.

SIR: In obedience to your order, the following detailed report of the apparatus fitted to the steam-launch *Success* during the past summer to convert her into a mechanically controlled boat is made:

The object of the fittings was to accomplish (mechanically) eleven different things, viz, to start, stop, and back the engines; port and starboard the helm; drop and fire two countermines, and also drop and fire a spar-torpedo ahead.

To control the engines and helm the same arrangements were used as in 1878 (see letter dated October 18, 1878); Lieutenant McLean's cylinder being used for the helm, and, for the engines, a similar cylinder with the additional fittings, designed by myself, was employed. These fittings consist of a third magnet connected to a rock-shaft carrying two arms that lock the valve, retaining it in a position for going ahead or astern with the engines; thus preventing the necessity of maintaining a closed circuit and any undue loss of electricity resulting therefrom.

The pressure used was a hydraulic one obtained from a small Blake pump, which was supplied with steam from the main steam-pipe between

the throttle and the engines and which exhausted directly into the condenser of the boat. The water was taken from the steam escape-pipe; this pipe connects the top of the boiler coil with the outside through the bottom of the boat, the opening being protected by a sieve; a steel flask, fitted with a gauge and a safety valve, was employed to obtain a large volume of water at a uniform pressure; this flask or reservoir was connected with the controlling cylinders by lengths of rubber hose; the exhaust from the cylinders and the overflow from the reservoir were lengths of rubber hose and connected to the feed-pipe of the pump.

The Blake pump was placed on the port side abreast the engines and the flask just forward of it abreast the boiler.

To avoid the use of a relay and a local battery in the boat, a multiple cable composed of five conductors, separately insulated with kerite and the whole wound with rubber tape, was used. A cable of this description, about 9,000 feet long found at the station was taken and 5,000 feet of it wound upon a common wooden reel, the inner ends of the conductors were attached to brass rings on a box-wood sleeve secured to the axle of the reel; on these rings pressed brass springs secured to a wooden bracket on the frame of the reel. The reel placed in the stern sheets of the boat was fitted with a friction brake to prevent the too rapid paying out of the cable. The cable passed through three fair-lead-ers, one on a wooden frame over the reel, one on the head of the rudder, and one secured to the end of an iron frame that extended from the boat aft some 12 feet to keep the cable clear of the screw. The main portion of the coil of cable was on shore where connections were made between the key-board and the different conductors by short pieces of wire, the insulation being removed from the conductors to make the connections; in this way the portion of the cable actually employed was alone introduced into the circuits.

The magnet-coils attached to the cylinders for controlling the engines and helm had one end of each coil connected to one of the conductors of the cable and the other ends of the coils to the condenser which was utilized as an earth.

The countermines were conical zinc cases containing 15 pounds of powder. These were fitted with anchors (stone) and an anchoring line of suitable length corresponding to the depth where the mines were to be dropped; the firing cable of each mine was stopped to the anchoring line; the mines and anchors were suspended, by open links secured to each, from detaching hooks (of my design, see letter dated September 24, 1878) hung at the ends of iron davits, one on each side of the boat; the cable and anchoring line being in a neat coil around the open link secured to the anchor. The coil of the electro-magnet of each pair of hooks was introduced into the earth branch of the steering circuits, the port mine in the port steering circuit, and the starboard mine in the starboard steering circuit. The firing cable was stopped by a split yarn to the iron frame extending astern, and the coil, ready for paying out, placed on shore, the end being connected to the key-board.

The torpedo fittings of the boat are those known as Converse's modified fittings; these permit the spar to be rigged out horizontally ahead, the outer end to be dropped at will so as to give the torpedo its proper immersion. To drop the spar, advantage was taken of this feature, the spar, rigged out, was maintained clear of the water by a slip strap and a toggle of glass tubing; the wire sling rope of the spar was belayed with sufficient slack to give the torpedo the proper immersion when the outer end of the spar was dropped. The dropping of the spar was accomplished by the shattering of the glass toggle, caused by the explosion

of a detonator containing 15 grains of the fulminate of mercury placed within the toggle. The detonator was introduced as a branch earth circuit to the backing magnet.

An exercise torpedo containing 5 pounds of powder was secured at the end of the spar and its leading wire brought in and secured to a circuit closer placed on the forward thwart of the boat. This circuit closer was connected as a branch earth to the start magnet and consisted of a stout brass spring that was kept clear of a stud under it by a wooden wedge; the laniard of the wedge was connected to the wire sling-rope of the spar so that when the spar was dropped the wedge was withdrawn and the spring coming in contact with the stud closed the circuit for firing the torpedo.

To insure a sufficient strength of current passing through this branch to fire the fuse in the torpedo, a resistance coil of 5 ohms was introduced into the main earth branch of the start magnet.

The firing circuit of the spar-torpedo was kept open until the spar was dropped when it was closed.

It was found that the insulation of the multiple cable was not as good as desired, and, in order to have a strength of current sufficient to insure the working of the apparatus a battery of 76 station cells was used. The battery located in the battery cellar was connected one pole to earth and the other by an insulated cable to the key board.

The key board necessary to close the different circuits consisted of 7 keys, viz: Start and fire the spar-torpedo; stop; back and drop the spar; port and drop the port countermine; starboard and drop the starboard countermine; fire the port countermine, and fire the starboard countermine. The movement of the helm being slow, the mines could be dropped without affecting the course; the engines moving, the spar could be dropped and the torpedo fired without affecting them the firing circuit was not closed until the spar was dropped.

On Friday, August 29, the boat was run before the class to illustrate the working of a mechanically controlled boat; on this trial the apparatus was only fitted to control the engines and helm the boat was successfully run the distance of 1,000 feet, turned around a schooner, and brought back to the starting point. During the run the engines and helm worked satisfactorily, the boat being under complete control; the engines were started, stopped, and backed a number of times and the boat steered as desired. Steam, 40 pounds; water pressure, about 50 pounds.

On Tuesday, September 2, the boat, fitted as described above, was run before the Board of Examiners. The 2,000 feet of cable laid out in the previous run was not rewound on the reel in the boat, leaving some 3,000 feet on the reel. The boat was started from the wharf and after running 200 feet the port countermine dropped, the boat turned to starboard, the starboard countermine dropped, the engines stopped, the spar dropped, the engines backed, the spar torpedo fired, the engines stopped, started, and the boat steered back to starting point; the starboard countermine fired, the port one failing, due, as found afterwards, to a leaky case. At first several hitches occurred, due, it is supposed, to bad contacts, as afterwards the apparatus worked satisfactorily. The drag of the spar after being dropped interfered greatly with the steering of the boat.

By experiment it was found that the explosion of an igniter in a glass tube would not insure the tripping of an object, as neither the wooden nor the copper cases were ruptured sufficiently to insure tripping; but

a detonator would in every case accomplish the result, shattering the toggle and cutting in two a $1\frac{1}{2}$ inch hemp rope.

The plan was hurriedly devised and many of the details improvised for the occasion.

If these experiments are to be continued, I would recommend the preparation of apparatus specially designed for the purpose, which would save much time that has now to be devoted to the fittings.

Very respectfully,

J. S. NEWELL,

Lieutenant and Assistant Inspector of Ordnance.

Capt. F. M. RAMSAY, U. S. N.,

Inspector of Ordnance, in charge of Station.

Respectfully forwarded for the information of the bureau.

F. M. RAMSAY,

Captain and Inspector of Ordnance, in charge of Station.

No. 30.]

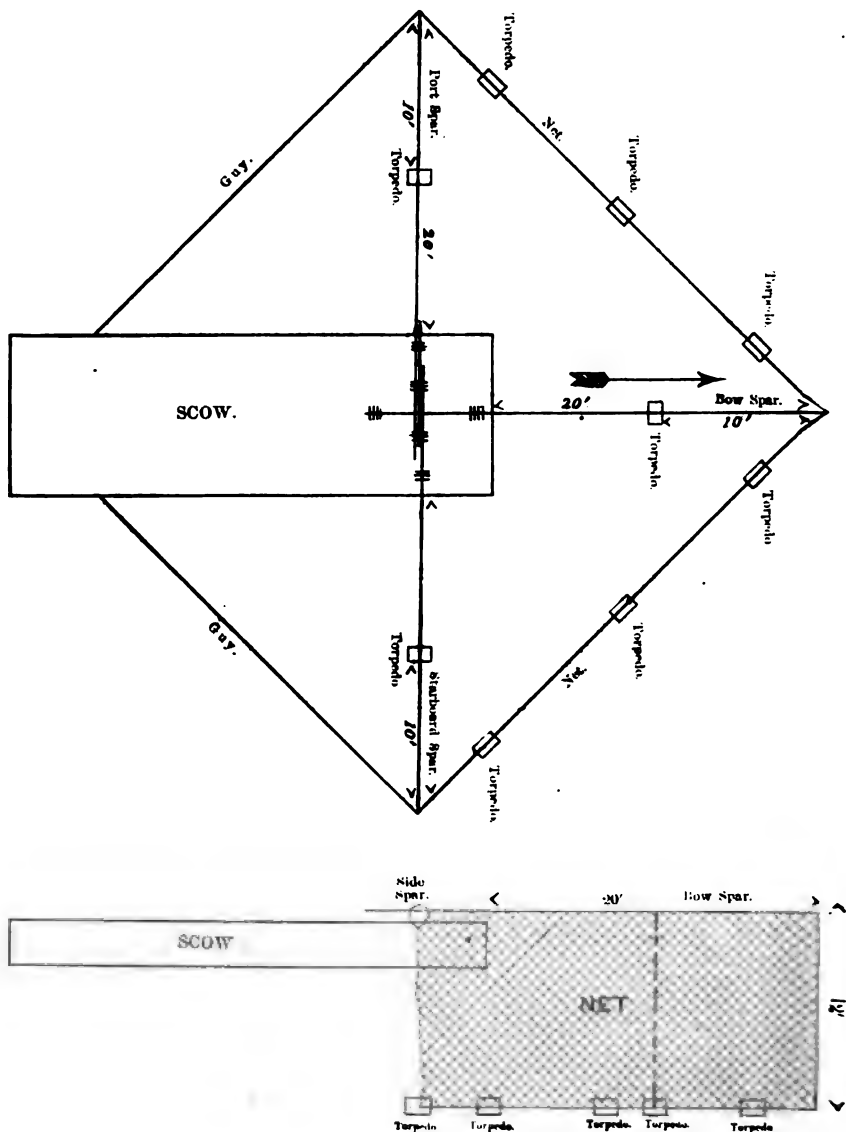
UNITED STATES TORPEDO STATION,

Newport, R. I., September 29, 1879.

COMMODORE: I have the honor to report having tested the plan of attack with torpedoes suggested by Lieut. F. H. Paine, U. S. N., in obedience to the bureau's order of July 30, as follows:

The steam-launch *Spray* was fitted to carry six torpedoes on each side. The torpedoes were tin cylinders, 14 inches long by 6 inches diameter, containing 10 pounds of powder each, and were lashed to a line at intervals of 12 feet. Cork buoys $6\frac{1}{2}$ inches in diameter were attached to the torpedoes by pieces of seizing stuff, each 12 feet long. Weights were also attached to the torpedoes to insure their keeping the proper depth.

An old float was used to represent a vessel. On this a spar was lashed to project 20 feet ahead, and two were lashed to project the same distance on each side.



A net 12 feet deep, made of 12-thread stuff, with meshes 16 inches long (seized), a head rope of $2\frac{1}{2}$ -inch hemp, and a foot rope of $3\frac{1}{2}$ -inch hemp, was stretched from the ends of the spars (as shown).

Six tin torpedoes, of the size before mentioned, filled with ashes, were lashed to the foot rope of the net, which also had weights attached to keep it down in the water.

A similar torpedo was hung to each spar, 10 feet from its outer end, by a line 12 feet long, and weighted.

The first experiment, on the 24th instant, was unsuccessful, owing to the difficulty of laying the attacking torpedoes in proper positions when

running at high speed. An attempt was made at moderate speed, but owing to a strong wind the launch sagged and, catching one of the buoy ropes in her screw, drew in and cut the conductor.

At the next attempt, on the 26th, the launch running at moderate speed, the attacking torpedoes were dropped in good positions just ahead of the net, but there being scarcely any tide and very little wind it became necessary to pull the torpedoes against the net in order to try the best effect. This required the assistance of another boat.

The explosions were simultaneous. The net was broken entirely through, head rope, foot rope, and meshes, perpendicularly in the center, and broken adrift from the head spar. The meshes were broken adrift from the foot rope for a space of three feet on the starboard side, about midway between the spars, and the head rope was stranded in about the same position on the port side. The lashings of the spars were carried away, and the forward end of the float was lifted by the explosion.

Only two of the torpedoes filled with ashes were found; one was adrift, uninjured, and the one on the port spar was still hanging from its place, but was mashed into a hexagonal figure having nearly equal sides.

It is believed that it will be found a very difficult operation to place attacking torpedoes around an enemy's vessel in the way suggested by Lieutenant Paine.

Very respectfully, your obedient servant,

F. M. RAMSAY,

Captain and Inspector of Ordnance, in charge of Station.

Commodore W. N. JEFFERS, U. S. N.,

Chief of Bureau of Ordnance,

Navy Department, Washington, D. C.

UNITED STATES TORPEDO STATION.

Newport, R. I., February 8, 1879.

COMMODORE: I have the honor to inclose herewith full-size tracings, Figs. 1, 2, 3, of a testing and firing board, designed by me, which will do all the work now performed by the "firing-key" and two "switch-boards," issued with torpedo outfits.

To use this "board," it is necessary to connect the machine wires with the posts *a* and *a'*, the torpedo wires with the post *k*, and to make an earth from the post *a'*, or from the machine direct.

The "short circuit," necessary for the dynamo-electric machines, is established through *a*, *b*, *b'*, *b''*, *a'*.

To test the fuse of a torpedo, turn its switch *k'* on the firing-plate *i*, and then turn the test switch *c* on the spring *b*.

When the spring switch *c* presses on the spring *b* it breaks the connection between *b* and *b'*, and the current passes through *a*, *b*, *c*, *c'*, *c''*, *c'''*, *i*, *k'*, *k*, and fuse to earth, back through earth to *a'* or machine. This current, if the circuit is complete, draws the keeper *d* and causes the hammer *e* to strike the gong *g*. After testing, the switch *c* is pushed back, releasing the spring *b*, which rises until it touches *b'* and re-establishes the short circuit.

To fire, press spring key *h* on spring *b*. Pressing key *h* on spring *b* breaks the connection between *b* and *b'*, and the current passes through *a*, *b*, *h*, *h'*, *h''*, *i*, *k'*, *k*, and fuse to earth, back through earth to *a'* or machine. When the pressure is removed from spring key *h* it breaks connection with *b*, which springs up and re-establishes the short circuit.

This "board" is arranged to fire four torpedoes, and will fire any one

of them, or all four at once. It can be made to fire an additional number of torpedoes, and the guns of a ship's battery by adding a post and switch for each torpedo or gun.

It can be used with a galvanic battery as well as with a machine.

The advantages claimed for this "board" over the present switch and firing key, are that the torpedoes or guns are switched into testing and firing circuits by the person who tests and fires, and the operation is not dependent on another person for that work; the operator has the "board" in his hands, or immediately under his eye, knows in which torpedoes or guns are in the testing and firing circuit; no matter in what position the "board" is placed the bell will sound whenever the test circuit is complete; the test will be known at night without a light; the only key to be pressed is the firing key, and it operates entirely independent of the test; there can be no mistake made about testing or firing, the test being made by switching in a key, and the firing by pressing one; the posts, switches, and firing key, are so arranged that a person familiar with the "board" could use it in the dark without fear of making a mistake.

This "board" can be placed amidships on the bridge, or in any position on board ship that may be desirable, where the wires of the machine and of the torpedoes can be led to it. Or, if the wires are led to screw posts on the bridge amidships, a piece of multiple cable can be used to connect these posts to those of the "board," and the commanding officer, or operator, could move about on the bridge carrying the "board" in his hand, by its handle, and test or fire the torpedoes from the most desirable position. Or, in a large vessel, a number of these "boards" could be in fixed positions—for instance, one on the mainmast, one on each side of the bridge, and one on each side of the stern or on each quarter, and by connecting their short circuits, the permanent wires being connected to the torpedo posts, any or all of the torpedoes could be tested and fired from the "board" most convenient to the operator. To accomplish this when there are four torpedoes, it will be necessary to have three wires running around the ship, one connecting the short circuits, one connecting forward torpedoes to "boards" on their respective sides, and one connecting after torpedoes to "boards" on their respective sides. The machine connecting wires would be needed only to the "board" most convenient to the machine.

Should this "board" meet with approval, its substitution for the present switch boards and firing key, when it becomes necessary to make new ones, would be an economy. The firing key costs \$30, and the switch boards \$20. The cost of this "board" will not exceed \$25. This "board" has been made and experimented with at this station. Its cost was \$42, which cost is due to its being the first, as well as to some alterations made by workmen, and to some alterations.

The screw posts for connecting wires can be placed on the under side of the "board" if considered preferable.

I am, sir, very respectfully, your obedient servant,

F. M. RAMSAY,

Captain and Inspector of Ordnance, in charge of Station.

Commodore W. N. JEFFERS, U. S. N.,

Chief of Bureau of Ordnance, Navy Department, Washington, D. C.

It has been deemed advisable to omit the plates.

TEMERAIRE 1878.



ALEXANDRIA 1877



MONARCH 1868.



NEPTUNE 1876.

COLBERT 1875.



REDOUTABLE 1876.



ADMIRAL DUPERRÉ 1879.



[This should have appeared in report of 1878, but was delayed in transmission.]

PARIS, FRANCE, *October 1, 1878.*

SIR: The models and drawings of iron-clad and wooden vessels of the French fleet, exhibited by the department of marine, form one of the most complete and attractive displays of the exposition, and in examining them carefully the observer is forcibly impressed with the originality and independence of design of French naval architects in building up their fleet, whose effective strength, although but little short of that of the English navy, is so little known or appreciated by others than those who have attentively followed the developments of naval architecture as exemplified in both countries.

As it appears to be the general impression amongst naval officers who have not made the subject a special study that the French have, in the majority of cases, simply modified and copied English designs in building up their fleet, and as no adequate idea of the real strength of the French navy can be formed except by reviewing the entire subject, I have considered that a report would possess the most value were I to compare the types and qualities of the vessels of the French fleet directly with those of their English prototypes, which are not only better known to Americans, but whose praises have been so long and loudly sung that we have come to look upon the English fleet as superior to those of all other nations combined.

I leave entirely out of consideration all those ships which, either through fault design or deterioration, have been removed from the roster of effective ships, dealing only with those which, at the present time, make up the real fighting force of the two nations.

In drawing a parallel between the two fleets, I make two grand divisions of the subject: the first, treating of the masted sea-going iron-clads; the second, of the coast defense and turreted sea-going vessels; and I find a satisfactory method of classifying the ships for comparison by grouping them in chronological order in accordance with three well-marked periods of time. The first, commencing with 1857, the date of laying down the *Gloire*, and closing with the appointment of Mr. Reed as chief constructor of the English navy in 1864; the second, from 1864 to the cessation of French iron-clad ship building on account of the war in 1872; the third, from 1873 to the present time.

During the first period the efforts of French and English architects were mainly directed to producing a fleet of thoroughly effective broad-side sea-going iron-clads, and the results obtained are very fairly shown in the ships of that group that appear on the active list to-day. They are as follows:

FRENCH.		ENGLISH.	
La Gloire.	Savoie.	Warrior.	Achilles.
Couronne.	Surveillante.	Black Prince.	Minotaur.
Heroine.	Valenreuse.	Defence.	Agincourt.
Provence.	Magnanime.	Resistance.	Northumberland.
Flandre.	Revanche.	Hector.	Repulse.
Gauloise.	Solferino.	Valiant.	Bellerophon.
Guyenne.			

The French can certainly not be accused of copying, in the construction of the *Gloire*, the pioneer sea-going iron-clad of the world. In this ship the armor forms a complete belt, having a maximum thickness of 4½ inches at the water-line, and extending vertically from 6 feet below the water-line to the spar-deck beams, the minimum thickness above water being 4 inches. This disposition answers exactly for all the other

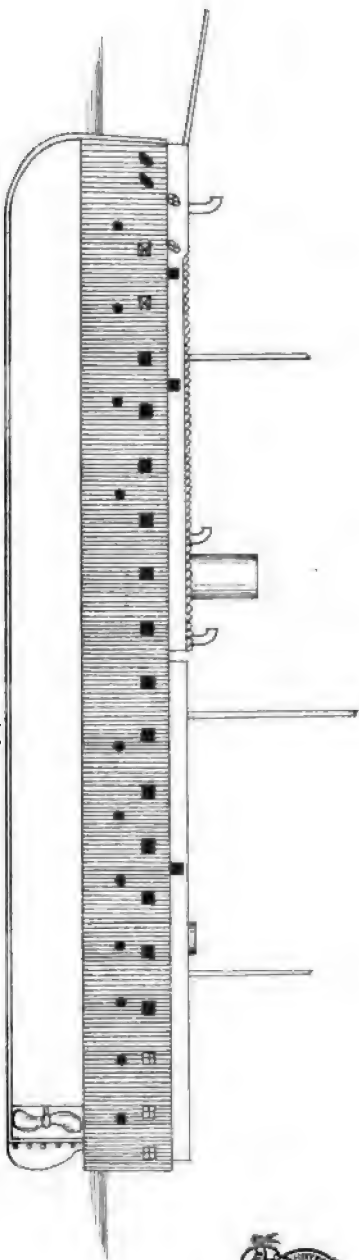
iron-clads in the list except the Solferino, the thickness at the water-line being increased after the Gloire in all the ships except the Couronne to 6 inches. Examining now the disposition of armor on the English ships, we find the Warrior, Black Prince, Defence, and Resistance provided with a shield amidships of a maximum thickness at the water-line of $4\frac{1}{2}$ inches. Whilst this shield covered about the same vertical space as the Gloire type, it left the end sections of the vessels completely unprotected for a distance of from 45 to 90 feet at each extremity. In the Hector and Valiant this disposition was modified so as to have a belt completely around the *main deck*, leaving the water-line as before unprotected except at the midship sections. The Achilles was originally intended to be similar to the Warrior, but was so modified that in addition to her midship armor she was provided with a narrow strake of armor (it can scarcely be called a belt) all around at her water-line. In the Minotaur, Agincourt, Repulse, and Bellerophon we finally see the English closing their group with a full belt from below water to spar-deck, as the French had commenced. The Northumberland, although one of the last and fully armored, must be classed as making a step backward, owing to the great reduction in thickness of armor at her end sections, which rendered it of little if any protection.

It has been urged against the French, as an evidence of lack of progress in their architecture, that having designed a certain type of ship, they repeated the design without modifying it, while the English showed their superiority in skill and ingenuity by constantly introducing modifications. The result of comparing these groups of ships shows plainly on which side the superior skill lies. In arrangement of armor alone we find four modifications introduced by the English, all tending towards and ending with the first design of the French.

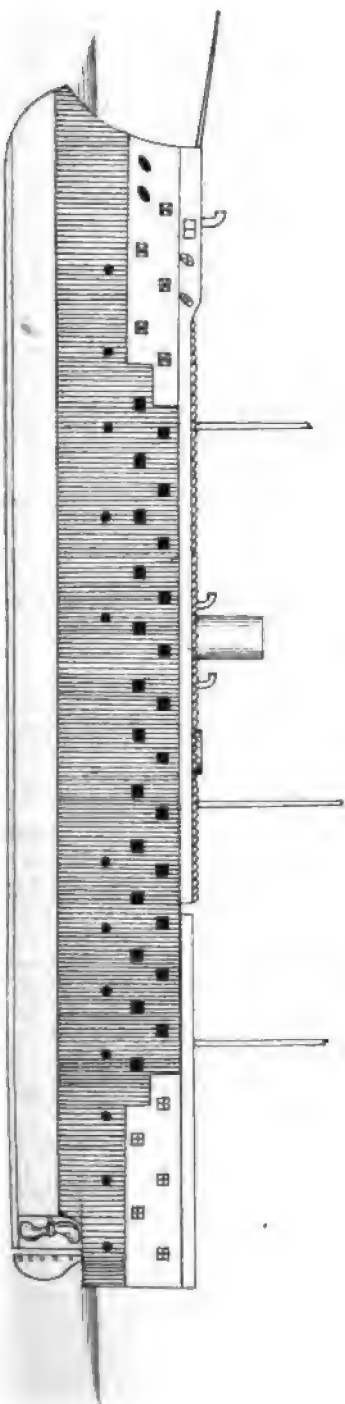
The Warrior, with an equal strength of battery with the Gloire, was in size about six-tenths greater, being 380 feet between perpendiculars against 252 for the latter. The Gloire, then, has the advantage of maneuvering power. In the English type we see length increased in the Achilles, and again in the Northumberland, the latter having 400 feet, whilst the Solferino, of the same battery power, has but 260. Again, we see the French holding fast to and repeating their short, handy ships, whilst the English, commencing with bad, go to the extreme of unwieldiness, until Constructor Reed, at one stroke, revolutionizes the whole system at once in the Bellerophon, the proportions of whose principal measurements are almost identical with those of the Gloire.

In the Gloire we find the straight ramming-bow, and it is continued in the others. In the Warrior we see the long clipper-bow, modified to the French form in the Defence. In the Solferino appears for the first time the long ram-bow, rejected in England until Reed launches his Bellerophon.

Much capital is made by the opponents of French iron-clads of this group that they have wooden hulls, whilst the English built of iron from the start. Whatever superiority is claimed to-day for the iron over the wooden ship can certainly not apply to the vessels of that period. Durability of iron loses all its force in face of the efficiency of these French ships, now eighteen years old. Indeed, the repairs made necessary by the iron hull of the Warrior are out of all proportion to those of any of her French contemporaries. Reed himself, as long ago as 1869, rested the claim of superiority of iron over wood not on durability but on comparatively less weights and on the *possibilities* of iron construction. Nor were these French ships wooden by any means. In them is seen the first approach in man-of-war building to the composite system. Braces,

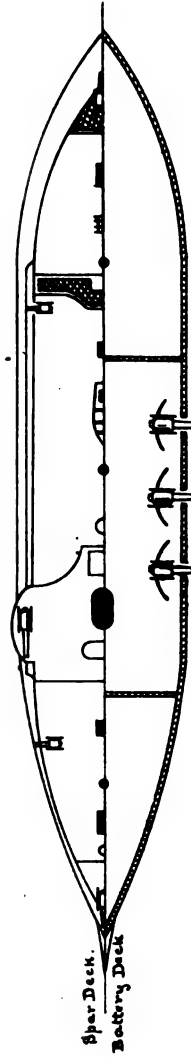
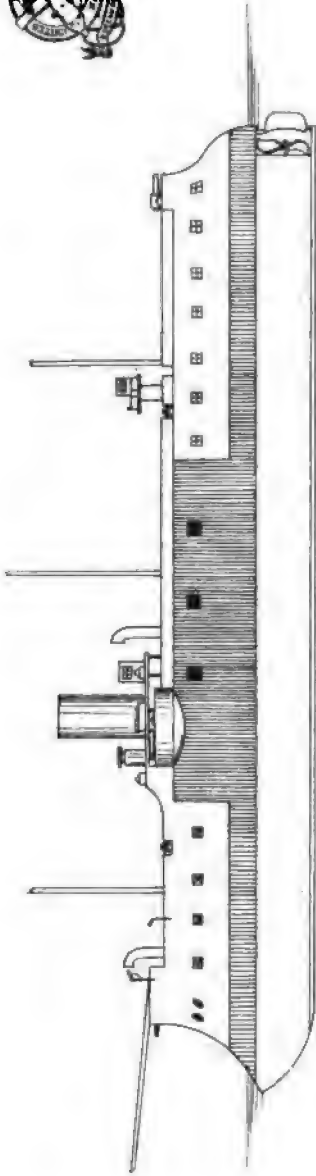


1859. GLOIRE.	1863. PROVENCE.	1864. GUYENNE.	1864. VALEUREUSE.
1861. COURONNE.	1864. FLANDRE.	1864. SAVOIE.	1865. MAGNANIME.
1863. HEROINE.	1864. GAULOISE.	1864. SURVEILLANTE.	1865. REVANCHE.



1861. SOLFERINO.

1861. MAGENTA.



Spar Deck.
Battery Deck

<u>FIRST RATES.</u>			
1874. FRIEDLAND.	1873. TRIDENT.	1873. COLBERT.	
<u>SECOND RATES.</u>			
1874. LAGALISSONIERE.	1877. TRIOMPHANTE.	VAUBAN.	
1875. VICTORIEUSE.	TURENNE.	BAYARD.	

knees, beams, and girders were of iron in nearly all of them. Superior strength can hardly be claimed for the English ships in face of the accident to the *Defence*, whose bower anchor swinging at the cathead punched a hole completely through her bow. Credit does belong to English constructors for iron hulls, but it is in the development, not in the ships of this period. In the same manner, to England belongs the credit of the introduction of water-tight compartments, but, as before, nothing can be claimed for these particular ships. The French ships, being projectile-proof, had no compartments. In the *Warrior* they were introduced to counterbalance the defect of vulnerability, but they were made so large that the filling of any one of them in action would so alter the trim of the ship as to make it impossible to use her battery, while she would be almost totally unmanageable. The same must be said of the other ships which were not fully armored. The counterpoise rudder is also an English development of this period, whose excellence is partially obscured by the vital necessity for its introduction in the long ships.

The speed of the English ships is in general from one to two knots greater than that of the French, but here again the English fall behind until the introduction of anti-fouling paint, which even yet is not satisfactory. In three months of sea commission the fouling of the iron bottoms reduced the speed from 14 to 11 knots, whilst the fouling of the French wooden bottoms in the same time reduced their speed not more than a half a knot, giving them undoubted superiority of speed in the chances of war.

The English introduced bow fire from the first, and in this point clearly set the example to the French. The bow guns were at first unprotected, but in the *Minotaur* class we find a shielded athwartship bulkhead across the spar-deck. In none of the French ships of this period is found any effective bow fire.

The first batteries provided for these ships were, as a whole, of about equal weight in the two groups, but defective powder reduced the power of the French guns below that of the English. In respect, then, of battery power the English artillery may be claimed as an offset to lack of handiness and ramming power.

As a whole, then, the French group of this period formed a more effective fleet than the English, allowing the *Bellerophon* to the latter, which really may be claimed as a ship of the second period. In all except battery power these ships stand to-day as they did then. In the latter, however, the English have passed to the front owing to the greater height between decks, and in a degree to the lighter iron hull permitting the introduction of a heavier caliber of gun. Before the retirement of these ships, however, battery strength must again pass to the French on the introduction of their steel 19 centimeter and 21 centimeter guns, with which the English cannot compete as long as they hold to the Woolwich system and dimensions. There are, I think, few American naval officers who would believe that the old *Gloire*, which has long been lost sight of, is to-day a match for the *Achilles*, which forms a part of the English war fleet at Besika Bay; yet such is undoubtedly the fact.

The groups which I have assigned to the second period are as follows :

FRENCH.		ENGLISH.	
Belliqueuse.	Montcalm.	Lord Warden.	Audacious.
Thetis.	Reine Blanche.	Pallas.	Invincible.
Alma.	Ocean.	Research.	Iron Duke.
Armide.	Marengo.	Penelope.	Swiftsure.
Atalante.	Suffren.	Hercules.	Triumph.
Jeanne d'Arc.	Richelieu.	Sultan.	Monarch.

By 1865 the rapid strides made in artillery development demanded greater weight of armor than could be carried in a complete belt, and with the *Belliqueuse* and *Thetis* the French commenced a type widely different from the former one, and yet in their departure from the old type the soundness of the original principles is seen in the gradation of the architectural changes.

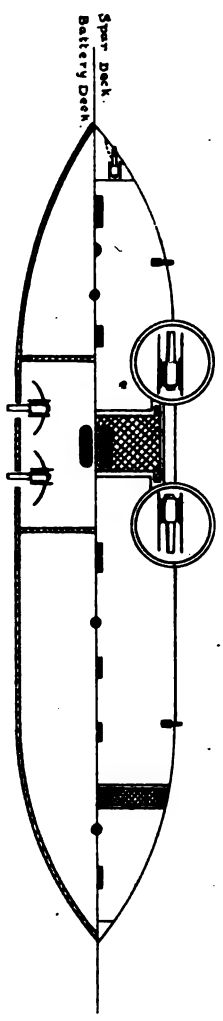
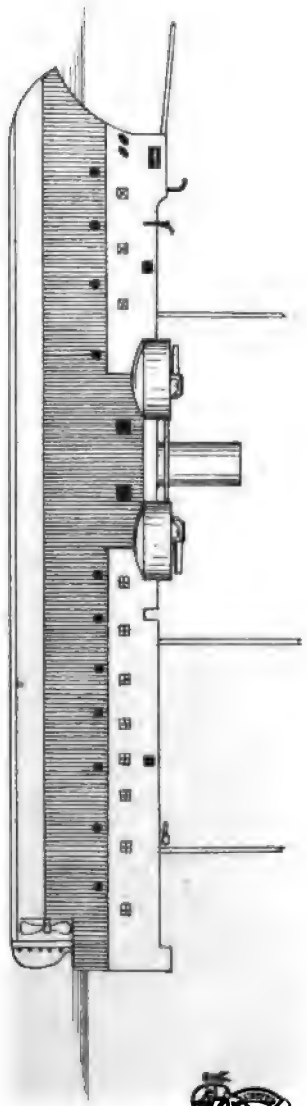
In the abrupt change on both sides from the extended old-fashioned broadside battery to the concentrated broadside with a command of fore-and-aft fire, the English constructor reaps the honor of the new development, although the French took the first step in that direction. In the *Solferino*, laid down in 1859, appears the first belt and box style. Her armor rises to, but not above, the main deck forward and abaft the battery. Both batteries are thoroughly protected by their side armor and armored *athwart ship bulkheads*. With the French the change from the old type to the new was completed by shortening the main-deck battery to a length proportionate to the additional weight of armor. No abrupt change of design was made, and the sole novelty was the introduction of the open-topped turret.*

Turning now to England, we find the *Bellerophon* closing the group of broadside iron-clads with an abrupt reversal of previous architectural ideas, and the life of the broadside type prolonged in the *Lord Warden*, which differed from the *Bellerophon* in having her armored main deck surmounted by a redoubt at the fore-castle to cover the bow guns and give protection against raking. In the *Pallas* appears the first step in the belt and box type—a concentrated battery amidships mounted in a box redoubt, with ports cut in the forward face for bow fire. In this first attempt the free-board of the ship is kept intact by a large hinged door, which in action is pushed in, opening the port in the forward face. In the *Research* the hinged door disappears, leaving the odd indentation in the side permanently open. In the *Penelope* and *Hercules* the system appears expanded to full dimensions, having the concentrated broadside with partially-developed bow and stern fire. A modification appears in the *Sultan*, which results only in giving a clear fire right astern; and finally in the *Audacious* type we find the main-deck battery modified to the French style, with fore-and-aft fire from an upper-deck citadel, whose architectural design is similar to the French, and whose superiority in style is questionable.

Comparing the groups we find that the *Lord Warden* properly falls between the two periods. Her type classes her with the *Flandre*, but her date of building is after the change to the belt and box type. The last of her style in the British fleet, she appears two years after the French had permanently ceased to build broadside iron-clads. One point in regard to her must be considered specially. With the object of protecting her from raking fire and giving a full protection to her bow guns, an armored redoubt was built at her bow, rising to the top of the fore-castle.

The *Pallas* being of nearly the same tonnage as the *Alma*, can be fairly compared with her. Her armor ranges in thickness from 3 to 5 inches as opposed to from 4½ to 6 inches in the latter. The dimensions are quite similar except as to height of battery; length, beam, and draught only differing from 3 to 5 feet, and displacement being only a little over 100 tons greater in the *Pallas*. In battery power the *Alma* has two 7½-inch rifles

* With the first ships of this type, the *Belliqueuse* and *Alma*, turrets were placed at each of the four corners of the redoubt, but finding that the weight of the after turrets brought them too much by the stern, they were removed in the *Jeanne d'Arc*, and her followers of the second-rate class, but were retained on the first-rates, *Ocean*, *Marengo*, *Richelieu*, and *Suffren*.



SECOND RATES.

1865. THETIS.
1865. BELLIQUEUSE.

1867. ALMA.
1867. ARMIDE.

1868. ATALANTE.
1868. JEANNE D'ARC.

1868. MONTCALM.
1868. REINE BLANCHE.

FIRST RATES.

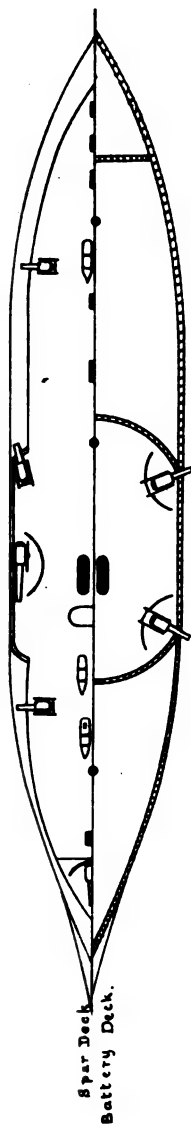
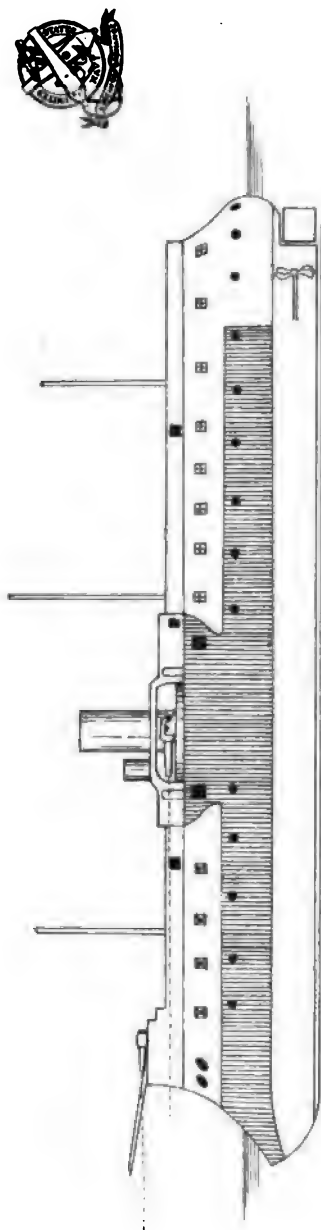
1868. OCEAN.

1869. MARENGO.

1872. SUFFREN.

1874. RICHELIEU.

• Dons Arm.



REDOUTABLE. DEVASTATION.
FOUDROYANT.

for straight-ahead fire, opposed to two 8-inch, that train only within 35° of right ahead. Three 7½-inch for beam fire against two 8-inch. Two 7½-inch stern fire against none. Battery power is then superior on the *Alma*, as well as armor. The barbette guns of the *Alma* are in an exposed position, but equally faulty and more dangerous is the arrangement of the battery of the *Pallas*, since it involves her whole battery. The recessed side permits a fair blow to be struck in the forward parts, with raking effect in an end-on approach, and as each gun is served in two ports at right angles to each other, the flank of the gun and the crew are always exposed to projectiles entering the empty port. The *Research*, from her small dimensions, falls too far below the lightest of the French ships for comparison. The *Penelope* shows armor ranging from 3 to 6 inches in thickness against from 4½ to 6 inches on the *Armide*. Two 8-inch guns fire to within 15° of right ahead against two 7½-inch straight bow fire. Four 8-inch for beam fire against three 7½-inch. Two 8-inch for stern fire only to within 15° against two 7½-inch right astern. The *Penelope*, then, with a superiority of displacement of 1,000 tons, gains only the advantage of one broadside gun, which, together with the greater caliber, is almost completely offset by the heavier armor of the *Armide*. The barbette guns are offset by the same main deck exposure noted in the *Pallas*. The *Hercules*, with 1,000 tons greater displacement than the *Marengo*, is far superior to her in both thickness of armor and battery power. In this ship, which is the full development of the belt and box type, is again seen the bow redoubt as in the *Lord Warden*. The *Sultan*, with a displacement 1,000 tons greater than the *Richelieu*, has armor 1½ inches thicker at the water-line. She has two 9-inch rifles bow fire to oppose to the *Richelieu*'s three 9-inch guns. The *Sultan*'s beam fire is four 10-inch and one 9-inch against three 10-inch and two 9-inch (practically equal in broadside action); stern fire, two 9-inch against two 9-inch. The exposure of the *Richelieu* turret guns is again set off by the raking exposure of the *Sultan*'s main-deck battery. The five ships of the *Audacious* class, with 1,000 tons less displacement, are superior in every way to the French first rates of this group. But this superiority is only obtained when the English do away with bow redoubts and a recessed main-deck, mount a citadel on the upper deck, projecting clear of the side, and in this manner, as in the first period, gaining the superiority only when they at the end adopt and perfect the type with which the French commenced. The *Invincible* and the *Ocean* stand in this period exactly in the relative position of the *Lord Warden*, and the *Gloire* in the first. The *Monarch* has no prototype in the French Navy. Whatever her qualities may be as a fighting ship, she has never been reproduced in the English Navy, unless the purchase of the whilom *Indipendenza* (*Neptune*) can be so considered.

To that third period belong—

FRENCH.

ENGLISH.

Friedland.	Vauban.
Trident.	Bayard.
Colbert.	Redoubtable.
La Galissonniere.	Devastation.
Victorieuse.	Foudroyant.
Triomphante.	Amiral Duperré.
Turanne.	Duguesclin.

Superb.
Alexandra.
Temeraire.
Shannon.

Nelson.
Northampton.
Neptune.



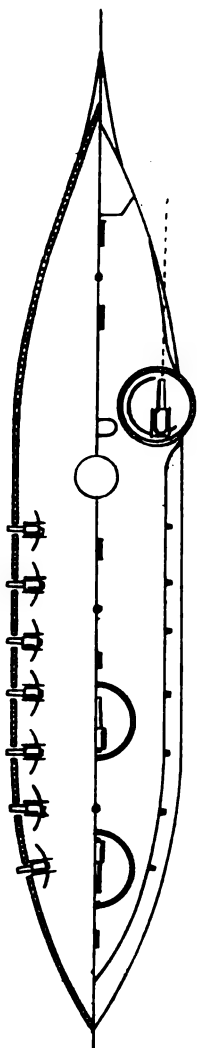
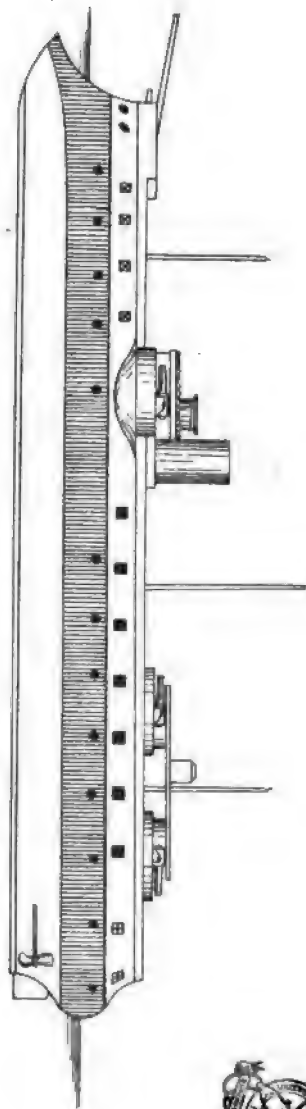
The *Colbert* and the *Superb* will bear comparison together, although the latter, with a superior displacement of 830 tons, carries a far heavier armor and numerical strength of battery. The *Colbert* is a ship of pe-

culiar interest, as being the only modification of the French types which has proved so unsatisfactory as not to bear repetition. In place of the barbette turrets, she was provided with armored forecassle and poop redoubts; the former covering two 10 $\frac{3}{4}$ -inch guns, the latter forming a breastwork for a 9 $\frac{1}{4}$ -inch pivot. The Superb belongs to the Hercules type, and would be classed properly with the second group, were it not that she was purchased from the Turks in 1877. The battery power is much better distributed in the French ship, as she has two 10 $\frac{3}{4}$ -inch guns for bow fire against two 7-inch; four 10 $\frac{3}{4}$ and one 9 $\frac{1}{4}$ inch against six 10-inch of the Superb for beam fire, and one 9 $\frac{1}{4}$ -inch against two 7-inch for stern fire. The Superb's battery, in spite of her great length, is very much crowded.

The Friedland and Trident are modifications of the Richelieu type, the armored turrets being done away with, substituting two spar-deck heavy rifles with a low splinter-proof cover in place of the former four heavy guns; the weight of guns and turret armor being utilized for thicker armor. These ships being the first ones in France having guns entirely unprotected, I compare them with the Nelson and Northampton, which are among the first examples of English "décuirrassement," and are within 840 tons of the Friedland's displacement. The English ships carry armor six-tenths of an inch heavier than the French, but the latter much more than compensate by the more complete protection. While the French keep the armored belt intact, the English cover only the engines and boilers, the side armor extending from the mizzen-mast to abaft the foremast. In the main-deck battery of 12 heavy guns, four are protected and eight totally unprotected against beam fire, and partially protected from raking fire. In the battery of eight heavy guns of the Friedland, six are wholly protected and two unprotected. In distribution of battery, the Nelson has two 10-inch for bow fire against two 10 $\frac{3}{4}$ of the Friedland. For beam fire the Nelson has two 10-inch and four 9-inch opposed to four 10 $\frac{3}{4}$ -inch. Here the French have but one gun unprotected while the English have four, which for lack of protection are assailable by four 5 $\frac{1}{2}$ -inch rifles of the Friedland. In reality, then, the broadside battery of the Friedland is stronger both in weight and number. For stern fire each ship has the same as for bow fire. The French ships are therefore stronger both in armor and armament.

The Shannon and Victorieuse, both second rates, come next in the scale, with the advantage to the Shannon of 1,000 tons displacement. The Shannon's lightest armor is equal to the Victorieuse's heaviest, but the latter gains the advantage in protection. The Shannon's battery, being all on the spar-deck, is completely exposed from above, and but two guns of the nine in her battery have the protection of side armor. Of the seven guns of the Victorieuse, four are wholly and two partially protected by side armor. The Shannon has two 10-inch guns for bow-fire opposed to two 9 $\frac{1}{4}$ and one 7 $\frac{1}{2}$ inch of the Victorieuse. For beam-fire she has one 10-inch and four 9-inch opposed to three 9 $\frac{1}{4}$ -inch, but since most of her battery is assailable by light guns, full weight must be given to the strength of the Victorieuse's additional light broadside of three 5 $\frac{1}{2}$ -inch guns. This help to the Victorieuse's battery added to the unprotected condition of the Shannon's spar-deck, and especially her vulnerability in having no protection from a raking stern fire, brings the fighting power equal if not in favor of the Frenchman. For stern fire the Shannon has one 9-inch against two 9 $\frac{1}{4}$ -inch. These two ships then can, I think, be considered as evenly matched in spite of the light armor of the Victorieuse.

The Redoubtable and Temeraire come next in comparison, there being



DUPERE.

DUGUESOLIN.

but a little over 200 tons difference in their displacement. In the Redoubtable appears a new type for the French. The belt and box still remain, but a change in the lines of the ship forward and abaft the battery throws the redoubt in strong relief, giving to the main-deck guns both bow and beam fire. A comparison of this type with the Hercules is remarkable, as showing how skillfully the French attained the object for which the English had long struggled and finally given up. A drawing of the form of this type of ship gives no adequate idea of the skill with which the design is worked up. In spite of the rank tumble-home of the sides before and abaft the redoubt, the ship has a very powerful shoulder, and the curves are so carried out as to completely rid the ship of any clumsy appearance amidships. The armored belt of the Redoubtable ranges on the water-line from 15.3 to 10 inches; that of the Temeraire from 12½ to 8 inches. Both ships have the same style of armored belt and battery, although the Redoubtable has the advantage in thickness. The bow fire of the Redoubtable is three 10½-inch guns opposed to three 12 inch of the Temeraire. The beam-fire of the Redoubtable is six 10½-inch opposed to three 12-inch and two 10-inch. The stern fire is three 10½-inch against one 12-inch. The Redoubtable has then the advantage of numerical strength of battery, which is neutralized by the unprotected position of the four spar-deck guns. Were it not for one point the Temeraire would be the better ship of the two. Since launching it has been found that her ends are overweighted, and she is unseaworthy. The architectural skill displayed in these two ships is well illustrated when they are compared. The opening of bow fire from the main deck being quite similarly designed in both ships, is far better carried out in the Redoubtable than in the Temeraire. The former opens her stern fire, while in the latter it is neglected. The English once more appear weighting down the ends of the ship, while the French retain seaworthiness, but only at the sacrifice of protection to the guns.

The Alexandra and the Foudroyant are the next on the list. The Foudroyant differs from the Redoubtable only in displacement and a sacrifice of numerical strength of battery for weight. The spar-deck battery is still wholly unprotected, while with the Alexandra a wise disposition of armor gives protection to the whole battery, while the spar-deck battery is transferred from the end to the midship sections, where it can be carried without overweighting the ship. In opening the bow fire of the Alexandra the same unsightly breaking of contour is noticed as in the Temeraire. She, however, secures the perfection of protected fire. Her armor for belt and main deck is like that of the Foudroyant, being 13½ inches on the water-line against 16½ of the latter. Her spar-deck redoubt is, however, a clear gain over the French ship. For bow fire she has two 12 and two 10 inch guns, opposed to four 12½-inch. For beam fire she has one 12-inch and five 10-inch, against three 12½-inch. For stern fire two 10-inch against two 12½-inch. In all but beam fire, then, the Foudroyant is superior, but the lack of protection to her spar-deck guns would seem to more than neutralize all advantage. In my opinion the Alexandra is the superior ship, although M. Dislère, in his "Guerre d'Escadre," gives excellent reasons for placing the Alexandra on a line with the sister ship of the Foudroyant.

The comparison of sea-going iron-clads closes with the Neptune and Admiral Duperré. The Neptune scarcely deserves to be placed beside her larger opponent, as she belongs to an earlier date. Still the comparison is of interest, the one ship representing the extreme development of the Monarch type and the other exhibiting a new departure for the French. In the Duperré the heavy main-deck battery totally disap-

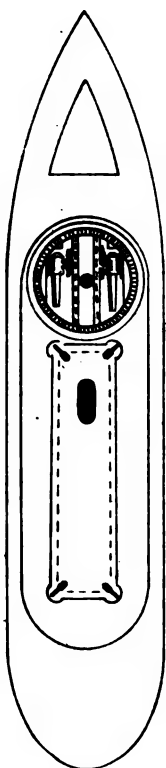
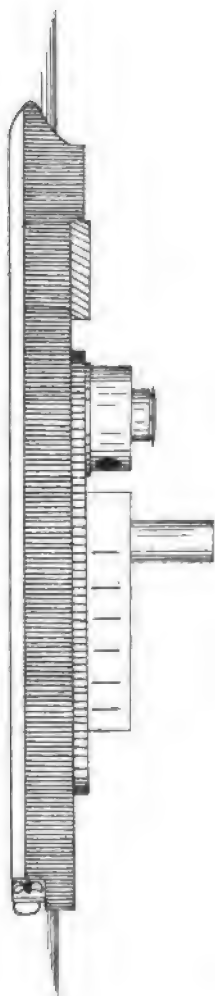
pears, giving way to numerical strength of light guns. The heavy belt rises all around, only to and not above the main-deck level, gaining by this a thickness of 23 inches at the water-line. In the Neptune there is no main-deck battery whatever, the armored belt rising throughout the midship sections to the height of the spar-deck with a thickness at the water-line of $13\frac{1}{2}$ inches. The Duperré then has greatly the advantage in armor disposition and weight. Both ships carry their heavy guns in spar-deck turrets, but with the difference in favor of the Neptune of completely covering the guns as compared with the barbette disposition of Duperré. The bow fire of the Neptune is two 7-inch guns opposed to two $13\frac{1}{4}$ and $6\frac{1}{2}$ -inch. The beam fire is four $12\frac{1}{2}$ -inch and one 7-inch opposed to three $13\frac{1}{4}$ -inch and seven $5\frac{1}{2}$ -inch, the advantage for light guns resting with the Neptune, which presents no vulnerable battery gun to the Duperré's main-deck battery, while the whole main deck is exposed to the Neptune's 7-inch. For stern fire the Neptune possesses nothing to oppose the Duperré's three $13\frac{1}{4}$ -inch. The Neptune's revolving turrets possess two very weak points: 1st. They are penetrable up to 1,000 yards and over by the Duperré's guns, and an accident to either turret at once destroys half her battery power. As a set off to this, the Duperré's turrets are penetrable at from 800 to 1,000 yards by the Neptune's guns, and the barbette guns are exposed to destruction even from the Neptune's 7-inch. As a partial recompense, however, these guns must be destroyed in detail. Their position enables them to be much more rapidly and effectively handled than the Neptune's, and I believe that there is no question as to the superiority of the Duperré.

In this new development of the French there is one point that appears to me to be in direct contradiction to their theories. It will be noticed that they have transferred their light rifles to the main deck and increased them with the object of gaining numerical strength when opposed to anything within the penetrating power of the $5\frac{1}{2}$ -inch caliber.

Any exposed gun must naturally come within the power of these guns, so that the upper part of the carriage and the breach mechanism of the barbette guns must be considered as open to attack from this caliber. Thus in this type the French make full preparation for an effective attack on a weakness which they develop to an extreme in the Foudroyant type and in a modified degree in the Duperré. At this moment the arguments in favor of the barbette turrets have received a rude shock from the development of the 2-inch Hotchkiss machine guns, against whose penetrating powers, when used from ship's tops, the light bridge covering is totally inadequate.

In summing up the comparison of these two fleets, the superiority in aggregate strength must be accorded to the English; but this superiority is in the main due to the greater tonnage floated. As far as architectural development is concerned the French have pursued by far the more thorough and economical course. It required the advent of Constructor Reed and the development of a type beyond its day to produce the Bellerophon of the same type and superior to the first French ships. It required great excess of displacement to produce the Hercules, superior to her prototypes in France. It required a complete overthrow of English systems and the adoption of the French design to produce the Invincible. The Alexandra stands alone an original triumph, differing entirely from, and superior to, any ship in the French Navy, in my opinion.

I do not mean to infer by this that talent to produce thorough iron-clads is lacking in England. On the contrary, the designing of such ships as the Kaiser, the Sachem, and the Cochrane speak loudly enough



TONNERRE.
FULMINANT.
FURIEUX.

TEMPETE.
TONNANT.
VENGEUR.

CAIMAN.

INDOMPTABLE.

TERRIBLE.

ONONDAGA.



in the praise of England's skill. Whatever is lacking in her navy must be charged to an undefined policy, political interests, and admiralty meddling. To officers of our own service there can be nothing more instructive than a comparison of England's heterogeneous fleet with the thorough-going squadrons of either France or Germany, and since we have a fleet to build, and cannot spend the millions that it has cost England to produce her fleet, it would seem that we could well take a lesson from the French policy; thoroughly decide upon what we want, how our needs will best be fulfilled, where we shall find the talent, and then, the preliminary steps being taken, go steadily and slowly forward until we have attained the end.

In the development of types of coast-defense vessels, the French appear to a decided disadvantage. Previous to the visit of the *Miantonomoh* to Europe there appears to have been but little attention given to the subject either by France or England. The fight between the *Monitor* and the *Merrimac*, however, had led to the conversion of one or two English line-of-battle ships into three-turreted monitors, which have played no more important part in the development of that country's coast defense than did the *Roanoke* in our own. In France, the first attempt (not considering the iron-clad batteries of the Crimean war) appears in 1863, in the *Taureau*, which appears to be a modification of the *Lady Nancy*, used by the English before Sebastopol. This craft is a ram, having a fixed turret with a single port. Her displacement is about 3,250 tons, and her armor ranges from 4.3 to 6 inches. For the time at which she was built she was apparently considered very powerful, although her light armor renders her rather weak at present. She can, however, be quite favorably compared with the *Hotspur*, which appeared in England six years after her. The *Hotspur's* displacement is nearly 700 tons greater than the *Taureau*, and her lightest armor is equal to the heaviest of the latter. Difference in thickness of armor, however, is almost, if not quite, neutralized by the weight of battery. The *Taureau* carries one 12½-inch gun, and the *Hotspur* one 12-inch. Both vessels having about the same speed, the *Taureau's* firing angle is limited to that given by her width of port, while the *Hotspur* has three ports in her fixed turret, one ahead and one on each side; the three ports for one gun making the defensive power of the turret decidedly questionable. The English modified this type of ship in the *Rupert*, but the French have never repeated the experiment of the *Taureau*. In 1864, however, a series of eleven floating batteries were built of the *Arrogante* type, carrying 5½ inches of armor, and originally intended to carry twenty-four 5½-inch rifles. This battery is reduced at present to four 7½-inch. These batteries have no prototypes in England, and beyond the first eleven no more have been built, as they have no speed and their seaworthiness is very doubtful.

Soon after the visit of the *Miantonomoh* to French ports, a modification of the monitor appeared both in France and England. In the latter country a departure from the American type was designed by Constructor Reed in elevating the turret above the American height and building a breastwork to inclose the foot of the turret, smoke-stack, and hatches. Like most of Reed's original and striking ideas this method of construction, an undoubted improvement on our monitor, has never been departed from. The French kept much closer to the American model in the *Bouledogue* type, the only noticeable change being the transfer of the single turret to the forward third of the vessel's longitudinal section. Removing the pilot-house from the top of the turret to just abaft it, and giving a sharp round-up to the deck, making it nearly semi-cylindrical.

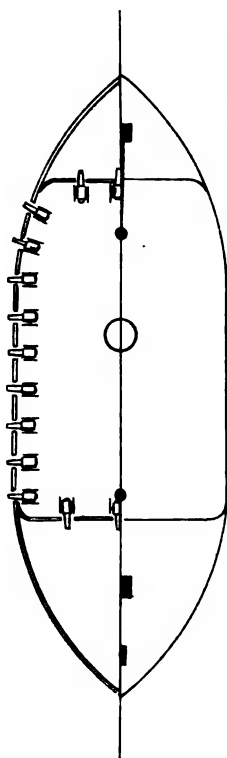
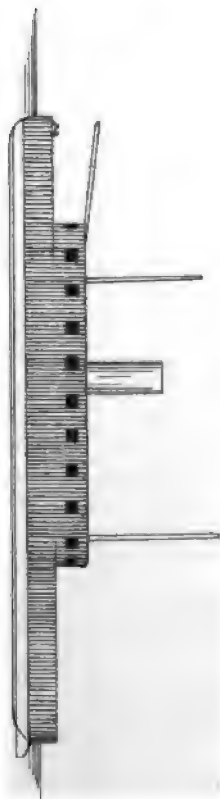
The four single-turreted monitors of this type are inferior in every point to their four double-turreted English rivals of the Cyclops class. The Onondaga, purchased from our own Navy, belongs properly to this group, although she is overmatched by the smallest of the English breastwork monitors.

The Franco-German war made an end of ship building in France until 1875, when, simultaneously with the creation of the Redoubtable type of sea-going iron-clads appeared the design of the new type of coast defense vessels represented by the *Tonnerre* and *Tempête*. These vessels are single-turreted breastwork monitors and closely resemble the *Glatton*. Six of them have been constructed, three first and three second rates, the *Glatton* in displacement falling about midway between them. The general disposition of breastwork, turret, and upper works is quite similar in both, with the exception of the pilot-house, which in the French type is mounted on the turret, as in the American monitors. The battery of the French ships gain also in height above water, being $13\frac{1}{2}$ feet above water-line as against $10\frac{1}{2}$ for the *Glatton*. The armor of the *Tonnerre* is 12 inches throughout on the water-line, opposed to from 14 to 12 on the *Glatton*. The turret armor is of the same strength on both. The *Glatton* carries two 12-inch guns against two $12\frac{1}{2}$ -inch of her rival. Owing to her late improved construction, more equal distribution of armor and heavier battery, the *Tonnerre* is much the superior and the superiority is still more marked in the *Tempête*, where, with a thickness of armor of not more than an inch less in any part, an advantage of three feet lighter draft is gained.

After the *Glatton* the English proceeded by rapid steps to the extreme development of the breastwork monitor in the *Thunderer*, the *Dreadnought*, and the *Inflexible*, and it is the general accepted opinion that Italy is the only country that has attempted to rival these ships. France, however, evidently does not intend to be left behind in the race, and it is with great regret that I am obliged to confine myself to meager information with regard to the three ships which, judging from displacement and weight of battery, must take a place between the *Dreadnought* and *Inflexible* if they do not quite equal the latter.

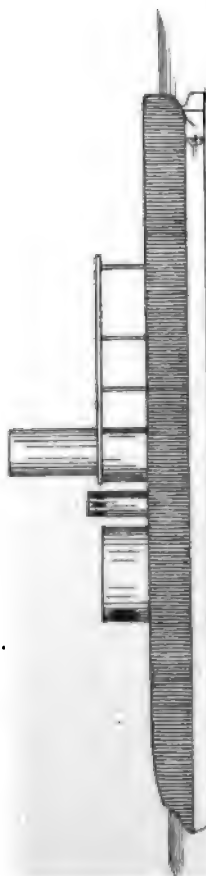
The *Caiman*, *Indomptable*, and *Terrible*, now in course of construction, are classed as coast-defense vessels, their batteries being each six heavy guns, and their displacement about 10,500 tons. The caliber of the guns, speed of ship, and type I have been unable to ascertain. Judging, however, from what has preceded in French coast-defense development, I am of the opinion that she is either a three-turreted monitor carrying six $13\frac{1}{4}$ -inch rifles, or a two-turreted ship with four $13\frac{1}{4}$ -inch, and two guns of a caliber not less than 11 $\frac{1}{2}$ inches, disposed in some manner behind the breastwork to give a good sweep. In the diagonal disposition of the *Inflexible*, which is the most favorable for all-around fire, but three of the four guns have bow and stern fire, while abeam she opens four guns. I have imagined it possible in the *Caiman* to place the turrets as in the *Dreadnought*, but closer together and raised about three feet higher above the water-line. The breastwork height would then be sufficient to allow a 12 and perhaps a 13 inch gun to be mounted behind it forward and abaft, at the elevation secured in our monitor turrets, thus securing the same all-around fire as the *Inflexible*, with a better disposition of turrets. If this disposition be possible (heavy guns behind the breastwork) by placing the two turrets diagonally, a perfect all-around fire of four guns is secured with bow and quarter angles of five guns.

However the disposition is made, the three ships can, I think, safely be taken as an offset to the *Thunderer*, *Devastation*, and *Dreadnought*,

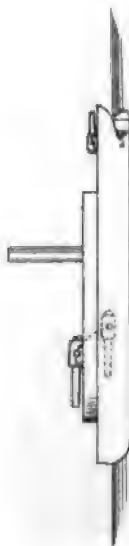


ARROGANTE.
OPINIATRE.
IMPLACABLE.
Nº 8. 9. 10. & 11.

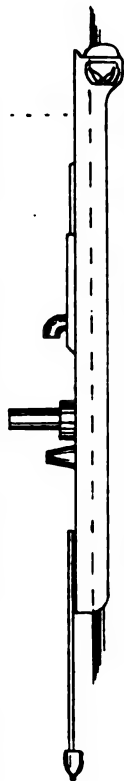
EMBUSCADE.
PROTECTRICE.
IMPRENABLE.
REFUGÉ.



TIGRE. BELIER. BOULEDOGUE. CERBERE. TAUREAU.



- | | | | |
|-----------|-----------|-------------|---------------|
| ÉPÉE. | FLAMBANT. | PERTUISANE. | ESPINGOLE. |
| TROMBLON. | FRONDE. | BAÏONNETTE. | FAULX. |
| BISCAÏEN. | GUÉPE. | CARABINE. | FLAMBERGE. |
| BOUTEFEU. | JAVELOT. | DAGUE. | FLEURET. |
| GLAIVE. | HACHE. | MASSUE. | MITRAILLEUSE. |
| RAPIÈRE. | JAVELINE. | MOUSQUETON. | REVOLVER. |



TORPEDO LAUNCHES. N^{os} 1 To 28.

leaving the English still in advance with the Inflexible, Ajax, and Agamemnon, and it is my opinion that in measuring the effective strength of the two fleets, taking all qualities into consideration, the factor of strength represented by the last mentioned three vessels will well represent the superiority of the English fleet. I have omitted mentioning several of the vessels either purchased or built by England, but they are completely offset by those of France belonging to some one of the types described.

In the development of our own Navy I think that little attention need be given to the general type of sea-going iron-clads, as it will, I think, never be represented, nor is it required by us. With coast-defense vessels, however, it is different. In case of foreign war they must be our main defensive dependence, and in their construction we may well take lessons from the European development. In rebuilding our iron-clads, as far as I know, there is no development whatever, for the change from wood to iron and consequent addition of weight of armor is at this late day no development. We make no attempt at a breastwork, although the English commenced with and have held fast to it, while the French, after trying with the *Cerbere* to improve on one low deck, have been obliged to copy from the English in the *Tonnerre*, a compromise with national pride that can only be appreciated by those who understand the feelings of French architects. The light draft of the *Tempete* fully demonstrates what can be accomplished in this direction without sacrificing stability, armor, or battery. We are led to the sober consideration of the ram type, sacrificing all other considerations for that of quick turning and ramming power, but after all as long as the enemy possesses a handy ship and a cool commander this matter of ramming possesses but a slight chance of success. Could we send a ram to skirmish about through a fleet of a dozen or more iron-clads in rigid battle order no doubt success would crown our efforts, but such a condition of things is not to be met with in the blockade of a port, which is precisely the one which we design the ram to meet. After all, the heavy, far-reaching shot is the only thing whose rapid and oft-repeated attempts stand a thorough chance of success, and in our coast defense we should not omit to find a place for the floating gun-carriage represented in the *Epée* of France, which, with a displacement of less than 180 tons, carries one 10-inch and one 5½-inch rifle, has a speed of eleven knots, and is really seaworthy.

Very respectfully, your obedient servant,

EDWARD W. VERY,
Lieutenant, United States Navy.

Commodore W. N. JEFFERS,
Chief of Bureau of Ordnance.

No. 4.—BUREAU OF EQUIPMENT AND RECRUITING.

NAVY DEPARTMENT,
BUREAU OF EQUIPMENT AND RECRUITING,
Washington, October —, 1879.

SIR: I have the honor to submit herewith the annual report of this bureau, with accompanying detailed estimates for the fiscal year ending June 30, 1881.

These estimates conform to the appropriations made for the fiscal

year 1879-'80, with the necessary addition of \$90,000 under appropriation "Pay of the Navy," and \$5,000 under appropriation "Contingent Equipment and Recruiting," to enable the bureau to comply with the act of May 12, 1879, authorizing the enlistment of 750 apprentices and boys, and \$100,000 additional, under "Pay of the Navy," for pay of 7,500 enlisted men, \$2,400,000 being required for that purpose, while but \$2,300,000 was appropriated for the current fiscal year.

During the past fiscal year 77 vessels have been either wholly or partially equipped at the several navy-yards, at an expenditure for labor of \$105,815.53, and for material of \$549,011.57.

Forty-one thousand three hundred and thirty-two tons of coal have been purchased at home and abroad, costing, including freight, \$297,531.

Two hundred and twenty-seven thousand one hundred and ninety-four pounds of Russia, 336,150 pounds of Manilla, and 112,775 pounds of American hemp have been purchased, at an aggregate cost of \$63,675.78.

There have been no contracts made during the past fiscal year; the supplies needed from time to time have been purchased in small quantities under "open purchase"; and experience has satisfied the bureau that this mode of making purchases is more advantageous to the government, and more especially so under present limited appropriations for supplies.

ROLLING-MILL.

The new rolling-mill at the Washington Navy-Yard has proved a perfect success, and since its erection, in 1878, has accomplished a saving of nearly \$12,000, being more than \$2,000 over and above its original cost. It is now furnishing large quantities of round, bar, flat, and angle iron for the use of the several Bureaus, and is capable of producing plate-iron, of a superior quality, weighing 800 pounds. With a moderate additional expenditure, all the plate-iron required for the manufacture of boilers for the Navy could, in my opinion, be made at this navy-yard. The erection of this mill has enabled the bureau to re-work and utilize all the condemned chains and iron which have been accumulating for many years at the different navy-yards, thereby supplying the service with an excellent quality of iron and effecting a great saving to the government. The capacity of the mill, at the present time being insufficient to meet all the demands made upon it, and in view of its great success, I would recommend that two additional furnaces, with boilers and hammer, be erected at a cost not to exceed \$8,000.

WIRE BOARD.

The board for testing different kinds of iron and steel wire completed its work some months ago. The results have been published and give general satisfaction. By purchasing wire direct from the manufacturers the bureau has effected quite a reduction in that item of expenditure.

ROPE-WALK.

The rope-walk at the Navy-Yard, Boston, Mass., has undergone the much-needed and quite extensive repairs during the past summer, and is now in complete working order.

During the year 848,726 pounds of cordage have been manufactured, comprising all the hemp, wire, and hide rope required for use in the Navy.

ANCHORS AND CHAINS.

All the anchors and chain cables used in the Navy are manufactured in the Washington Navy-Yard.

The Bureau has been and is still making experiments with anchors of different patterns, in the hope of obtaining a satisfactory non-fouling anchor which will fulfill all requirements.

GALLEYS.

All galleys required on board of our men-of-war are also manufactured at this yard. Improvements are constantly being made in their construction, with the view of supplying the many wants so essential for the proper preparation of food.

COAL.

During the year advantage was taken of the low price of coal and freights to fully supply our several coal depots and stations. In order to stimulate our own industries, instructions have been given to the commanding officers on foreign stations to use American anthracite coal, in preference to foreign coal, whenever it could be procured of a good quality and without additional cost.

WATCH, QUARTER, AND STATION BILLS.

These bills, lately gotten up by this bureau, seem to have secured a uniform system for stationing men on board of our vessels of war, and answer admirably all requirements.

HONORABLE DISCHARGES AND CONTINUOUS-SERVICE CERTIFICATES.

During the year, 620 men have received honorable discharges, of which number 499 were granted continuous-service certificates and 336 good-conduct badges.

Four hundred and sixteen men have re-enlisted under honorable discharges and continuous-service certificates.

The following men have received medals of honor for heroism in rescuing shipmates from drowning, viz: Thomas Smith, seaman, Enterprise; Walter Elmore, seaman, Gettysburg; John Flannagan, boat-swain-mate, Supply; P. J. Kyle, landsman, Quinnebaug.

RECRUITING.

There were 7,406 men in the service on the 30th day of June, 1879, distributed as follows:

Afloat (including 794 apprentices).....	6, 629
Available and detailed.....	183
Apprentices under instruction.....	459
Sick in hospitals.....	135
	<hr/> 7, 406

During the year the number of enlistments to replace men discharged by reason of expiration of term of service and other causes amounted to 5,119.

The exhibit of the conduct reports received from vessels in commis-

sion continues to show a marked improvement in the *morale* of the enlisted men, conducing greatly to the efficiency of the service.

A source of impairment, however, to which I desire to call your attention, has long existed in the service, and tends to weaken our already very limited working force of seamen. I speak of the large number of what might be called old, worn-out man-of-war's men. These men having spent their youth and vigorous manhood in the service of the government, naturally drift back to the only home they have ever known, and frequently are enlisted more through sympathy than from any anticipated service they may render afloat. The Navy of to-day is hampered with them, and I therefore earnestly recommend that some legislation be called for (other than by enlistments) tending towards the care or employment of these deserving people, who, in consequence of their long and faithful service, ought to be regarded as wards of the nation and be fostered by the government.

In connection with this subject, I also have to state that the effective force of the service is very materially crippled by the taking away from the 7,500 men allowed by law 275 men who are almost constantly employed in the Coast Survey service. The United States Naval Academy also draws its quota, amounting in the winter months to 100 men, and during the summer cruise for cadets 371 men are required to man the practice ships. Thus we find an aggregate of 375 men in winter and 646 in summer, employed in a useful yet special service, and not available for regular cruisers.

I therefore respectfully recommend that legislation may be asked for to make the allowance of men required for these two branches of the service, viz: the Coast Survey and the United States Naval Academy, a special one, and independent from the allowance of men for the Navy.

TRAINING SYSTEM.

The reports from the commanding officers of cruising-ships who have received boys from the training ships, speak in the highest terms of them.

The Bureau is satisfied that, with judicious care in handling, and attention on the part of the officers in instructing these boys, the service, in a few years, will be supplied with a superior class of intelligent, well-trained American seamen, of whom the nation may justly be proud.

On the 12th of May last, Congress passed an act allowing 750 boys to be enlisted annually, in addition to the 7,500 men and boys already allowed by law; at the same time changing the ages at which these boys should be enlisted from 15 to 18 years, instead of from 16 to 18 years. I think it would have been more satisfactory if the law had been so modified as to have taken them between the ages of 14 and 16 years, as boys are then more satisfactorily managed, and are not so mature as to have acquired fixed habits.

Shortly after the passage of the law, steps were taken for the enlistment of boys in different sections of the country, recruiting heretofore having been principally confined to the seaboard. Accordingly the United States steamer Wachusett was dispatched up the Mississippi River, with instructions to proceed as far as Saint Louis, Mo., and to recruit at different places, both going up and returning. On account of insufficient depth of water, she failed to reach her destination. However, a rendezvous was opened in Saint Louis, and it required but a short time to fill the quota allotted to that section.

At the same time instructions were given to the United States steamer Michigan to recruit at numerous places on the lakes; the United States steamer Minnesota was sent up the North River; the United States ship Saratoga and United States ship Portsmouth touched at many of the Eastern ports during their summer cruise, and in this way, from the passage of the law to this date, upwards of 600 fine, healthy, bright lads have been recruited, representing almost every State in the Union.

Early in the season it was thought advisable to have the training ships assemble at Hampton Roads during the month of October for drill and exercise. Instructions were accordingly given to that effect, and at the inspection which took place on the 14th and 15th instants you were satisfied with the very creditable manner in which the boys acquitted themselves.

The old frigate Constitution has lately been added to the list of training ships, and I find it necessary to have at least one more vessel added to the number, in order to keep the boys up to the many requirements.

With four cruising-ships, I would recommend that they all cruise during the summer. In winter, while two might make a southern cruise, the other two could be profitably employed at the headquarters for training ships, in refitting, &c. I find the Minnesota entirely too large for a cruising training ship, and in that capacity very expensive. I would therefore recommend that she be used as a headquarter's ship, and be located permanently at some convenient naval station to receive and prepare boys for the cruising training-ships.

Numerous complaints are constantly being received concerning the ration, not so much on account of the quantity as the variety. I would here suggest that a board be ordered to thoroughly investigate the matter, and to recommend such changes as might be consistent.

In May last, Lieutenant-Commander Chadwick, U. S. N., who was then in England, was instructed to visit the different training stations of England and France, and make a report upon them to this Bureau.

The report has been received and gives great satisfaction, and in a printed form would be of much service to the officers connected with the training system. I would recommend a limited number be printed for that purpose.

In conclusion, I earnestly renew the recommendations of my predecessor in office, that an outfit of clothing be furnished gratuitously to men and boys upon their entering the service for three or more years. This practice prevails in the Army and Marine Corps, and it would seem nothing more than justice that "Jack" should have the same. By its adoption in the Navy, I am satisfied it would tend very materially to reduce the number of desertions. This allowance is especially desirable for the boys. Their pay on entering being so small, the plainest outfit of comfortable clothing keeps them in debt many months, thereby tending to dishearten them at the start, and to give them a distaste for the service. It must be remembered that the clothing they bring with them from their homes is all lost, for nothing but uniform is allowed to be worn on board ship.

Very respectfully, your obedient servant,

EARL ENGLISH,
Chief of Bureau.

Hon. R. W. THOMPSON,
Secretary of the Navy, Washington, D. C.

Estimates of appropriations required for the service of the fiscal year ending June 30, 1881, by the Bureau of Equipment and Recruiting, Navy Department.

Detailed objects of expenditure and explanations.	Estimated amount which will be required for each detailed object of expenditure.	Amount appropriated for the current fiscal year ending June 30, 1880.
SALARIES, BUREAU OF EQUIPMENT AND RECRUITING.		
Chief clerk, per Rev. Stat., (page 70, section 416, and per act June 21, 1879, Stat. L., vol. 21, page 23, section 34)	\$1,800 00	
One clerk of class four, (per Rev. Stat., page 27, section 167; same act, Stat. L., vol. 21, page 23, section 34)	1,800 00	
One clerk of class three, same act	1,600 00	
Two clerks of class two, same act	2,800 00	
Two clerks of class one, same act	2,400 00	
One assistant messenger same act	720 00	
One laborer, same act	600 00	
	11,780 00	\$11,780 00
CONTINGENT EXPENSES, BUREAU OF EQUIPMENT AND RECRUITING.		
Stationery, books, and miscellaneous items (appropriated, Stat. L., page 23, section 34)	500 00	500 00
EQUIPMENT OF VESSELS.		
Coal for steamers' and ships' use, including expenses of transportation, storage, and handling; hemp, wire, and other materials for the manufacture of rope; hides, cordage, leather, canvas; iron for the manufacture of cables, anchors, galleys, and chains; furniture, wood, bake-ovens, and cooking stoves; boat detaching apparatus, life-rafts, and hose; heating apparatus for receiving-ships; and for pay of labor in equipping vessels and manufacture of equipment articles in the several navy-yards (per Rev. Stat., page 733, secs. 3709, 3747; appropriated, Stat. L., vol. 20, page 287)	800,000 00	800,000 00
CONTINGENT.		
Expenses of recruiting and fitting up receiving-ships; extra expenses of training-ships; freight and transportation of equipment stores; transportation of enlisted men and boys; printing, advertising, telegraphing; books and models, stationery, express charges, internal alterations, fixtures, and appliances in equipment buildings at the several navy-yards; foreign postage, car tickets, ferriage, ice; apprehension of deserters; assistance to vessels in distress; continuous-service certificates and good-conduct badges for enlisted men; school books for training-ships and extra medals for boys (per Rev. Stat., page 721, section 3666; appropriated, Stat. L., vol. 20, page 287)	55,000 00	50,000 00
NOTE. —The estimate under appropriation, Contingent, Equipment and Recruiting is increased \$5,000 over amount appropriated for the current fiscal year, on account of the increased expense of opening rendezvous in different parts of the country for the enlistment of boys, under act approved May 12, 1879, including their transportation and the purchase of school books.		
CIVIL ESTABLISHMENT.		
Navy-yard, Kittery, Me.:		
One clerk	1,300 00	
Navy-yard, Boston, Mass.:		
One superintendent of ropewalk	1,800 00	
One clerk	1,400 00	
One clerk	1,300 00	
One writer	1,017 25	
Navy-yard, New York:		
One clerk	1,400 00	
One clerk	1,300 00	
Navy-yard, League Island, Pa.:		
One clerk	1,300 00	
Navy-yard, Washington, D. C.:		
One clerk	1,400 00	
One clerk	1,300 00	
One writer	1,017 25	
Navy-yard, Norfolk, Va.:		
One clerk	1,300 00	
Navy-yard, Pensacola, Fla.:		
One writer	1,017 25	
Navy-yard, Mare Island, Cal.:		
One clerk	1,400 00	
(Appropriated, Stat. L., vol. 20, page 287.)	18,251 75	18,251 75

NO. 5.—BUREAU OF NAVIGATION.

BUREAU OF NAVIGATION, NAVY DEPARTMENT,
Washington, D. C., October 25, 1879.

SIR: I have the honor to submit the following report of the Bureau of Navigation for the past year, together with the estimates for its support, and for the expenditures that will probably be required in that division of the naval service committed to its immediate charge, for the fiscal year ending June 30, 1881. Included in this report, and transmitted herewith, are the reports and estimates of the several offices under its cognizance, and an abstract of offers for supplies received.

NAVIGATION.

In the allowance of nautical instruments and other navigation supplies for ships-of-war, no change has taken place during the past year. Owing to limited appropriations, the stock of instruments could not be materially increased, but those available were kept in good order. The superior character of instruments used in the Navy is well established, notably is this the case with chronometers, liquid compasses, and barometers, and it is also gratifying to state that these instruments, as well as sextants, octants, quadrants, surveying and other instruments of precision, of excellent quality, can now be obtained from American makers; only in the matter of superior binocular glasses the Bureau had to resort to foreign manufactures, and it is hoped that this branch of industry may soon be developed to make importations unnecessary.

Unless some emergency arises, it is believed that the supply of liquid Navy compasses is sufficient for the service of the current fiscal year; but, if the appropriations will permit, it is proposed to add to the stock of nautical instruments a number of superior sextants and chronometers of American manufacture, to replace those to be retired from use.

Of the many compasses and sextants purchased during the late war, the inferior instruments have since been gradually retired and sold, leaving, however, a considerable number of dry compasses and ordinary sextants yet on hand. There remains also from the late war a vast number of signal lanterns, running and standing lights, ordinary lamps and lanterns, of obsolete forms and inferior construction, which take up considerable space in the storehouses. I earnestly recommend that legislation be obtained to sell such stores and devote the proceeds to the procurement of articles of improved kind.

HYDROGRAPHY.

I take pleasure in referring to the appended report of the Hydrographer of the operations of the Hydrographic Office during the past year, proving very efficient management of its affairs and a high degree of usefulness. It is particularly gratifying to note that the charts, sailing directions, and current hydrographic notices which emanate from this office are appreciated by mariners at home and abroad, as evinced by increased sales and by requests from foreign hydrographic offices for an exchange of publications.

The usefulness of the Hydrographic Office could, however, be greatly enhanced if more liberal appropriations were made for foreign surveys and explorations.

The examinations of the great oceans, with their innumerable rocks,

islands, and reefs, real and imaginary, would seem to be the duty of the navies of civilized nations, and no more useful and creditable service can be performed by naval officers in time of peace. The labors of the several expeditions sent out from this country years ago under Commander Charles Wilkes, Commodore M. C. Perry, and Commander John Rodgers, were not only highly creditable to this country and to all who were engaged in those expeditions, but they form in many instances the only information we have at present of many distant parts of the world. The soundings made in the North Atlantic by United States naval officers were found extremely useful in the projection and laying of the Atlantic cables, and the work of Captain George E. Belknap of sounding across the Pacific Ocean is soon to bear fruit in the proposed cable connection between this country and Japan. As civilization and commerce are spreading over the globe, all work of this kind will become practically useful, and those engaged in it be honored.

Prior to and since the establishment of the Hydrographic Office of this Bureau, naval officers have been engaged in collating the many reported dangers of the great oceans. Books have been published containing descriptions of them, and their positions have been marked on the charts. It may be fairly assumed that the greater part of those dangers does not exist, and that their number was multiplied through several persons reporting the same danger in different positions, owing to faulty reckoning and observations or to defective instruments.

But as long as these doubtful dangers to navigation are not properly examined and located, if existing, or eliminated from books and charts if not existing, their presence on the charts and books will always be a source of evil and insecurity to the mariner who has to grope his way among them to his place of destination.

I, therefore, recommend that the Department take the examination of reported dangers in the Atlantic and Pacific Oceans into serious and favorable consideration. It cannot be expected that the work here proposed can be finished in a few years or in a space of time to be stated in advance. If the Department cannot, on account of insufficiency of funds or for other reasons, fit and send out expeditions composed of a number of vessels, as was done before, it is respectfully suggested that a practical beginning be made by detailing at least one vessel for this service in the Atlantic and another for the Pacific Ocean.

Searching for hidden or visible dangers to navigation is no longer as difficult as it might appear, for with our improved sounding apparatus the depths can now be readily ascertained, and any serious diminutions in the soundings would be fair indications of the presence of neighboring shoals, reefs, or islands.

From the great number of dangers now borne on our charts, it is evident that the work here proposed will, of necessity, have to be done sooner or later. The sooner it is done the more lives and property will be saved, and every examination of a doubtful position, if properly executed, helps to lessen the present insecurity of the navigation of many parts of the great oceans.

The thanks of this Bureau are due to the commanding officers of squadrons and vessels, for the promptitude with which they complied with general instructions for the collection of hydrographic and other information useful in navigation, and with occasional requests for specific work of sounding and surveying.

In completion of the work of telegraphically determining the longitudes of the east coast of South America, Lieut. Commander F. M. Green has measured the exact difference of longitude between the

observatories of Greenwich and Lisbon, thus connecting former measurements with the primary meridian; and Lieut. Commander C. H. Davis has measured in the same manner between Pernambuco and Rio de Janeiro (the breaking of the telegraph-cable between these points having prevented this measurement last year), and from Pernambuco to Para. A complete chain of telegraphic measurements has thus been made with great exactness, for the first time, from Greenwich to Buenos Ayres, establishing precisely the geographical positions of Lisbon, Madeira, Porto Grande, Pernambuco, Bahia, Rio de Janeiro, Montevideo, Buenos Ayres, and Para.

This work of fixing the geographical positions of a number of principal points on the Atlantic Ocean with almost absolute correctness is of prime importance, and the manner in which it was projected and carried out reflects great credit upon the officers engaged in it and on the Navy generally.

The United States steamer *Tuscarora*, Commander J. W. Philip, having, during the past season, surveyed the west coast of Mexico from Mangrove Point to Port Ventosa, has returned to her field of operations, and it is expected that the projected survey from the said port to the Gulf of Fonseca will be completed during the present season. From the surveys thus far received from Commander Philip, it is inferred that the work will be done in a thorough and satisfactory manner, and the charts to be constructed therefrom, connecting with those of the surveys previously made under Commander George Dewey in the United States steamer *Narragansett* from the United States boundary to Cape Corrientes, will form a valuable contribution to geography and improved aids to the navigation of the waters near that part of the coasts of this continent.

Additional appropriations will be required for the preparation and publication of these surveys, as also for those made last year by Commander T. O. Selfridge, of the *Amazon* and *Madeira* rivers.

Commander L. A. Beardslee, commanding the United States ship *Jamestown*, stationed in Sitka Harbor, is employing his time in a very useful manner, in surveying and sounding, and in placing buoys and beacons for the safer navigation of the channels. All data of this kind thus far received from the *Jamestown* have been forwarded to the office of the United States Coast and Geodetic Survey for publication.

The United States steamer *Essex*, Commander W. S. Schley, before leaving the South Atlantic station for home, performed the very important service of examining the approaches to the La Plata River, proving by the many lines of soundings made off and to the shore, and by cross lines, that this examination was efficiently executed, and that the charts of the mouth of that river will be greatly improved thereby.

The United States ship *Saratoga*, Commander R. D. Evans, has obtained valuable deep-sea soundings during her late cruise to the Azores, Madeira, and Canary Islands.

From the United States steamer *Ticonderoga*, the flag-ship of Commodore R. W. Shufeldt, some interesting reports and data of explorations of parts of the coast of Liberia and the mouth of the Congo River have been received.

The collection of material for the *Sailing Directions* for the Mediterranean Sea, upon which Lieut. Commander H. H. Gorringe had been employed, has come to a close through the breaking down of the machinery of the United States steamer *Gettysburg* last spring. From the data obtained, three volumes have been published.

Commander Frederick Rodgers has sent to the bureau an interesting

report of the cruise of the United States steamer Adams from Panama to the Samoan Islands, which contains much useful information.

The United States steamer Wachusett, Commander Byron Wilson, is under orders to run a line of deep-sea soundings on her way from Boston to the coast of Brazil, and to examine some reported dangers.

SIGNALS.

From the quarterly returns received from vessels in commission, it is inferred that satisfactory progress is made in the instruction and practice of signaling by the Army method.

Some very important trials of different kinds of night signals have been made during the past year at the Naval Academy, with results generally favorable to the signal invented by Lieut. E. W. Very, U. S. N.

NAVAL OBSERVATORY.

I beg leave to invite your attention to the appended report of Rear-Admiral John Rodgers, of the operations of the Naval Observatory. His recommendations for an early removal of the observatory to a better site, I fully concur in; also those for increased appropriations, for the amounts appropriated for several years past have been found inadequate for the maintenance of the Observatory in a manner conforming to its high standing as a national scientific institution.

NAUTICAL ALMANAC.

The appended report of the superintendent of the Nautical Almanac states the number of volumes of the Ephemeris sold and distributed for the public service and for scientific and educational purposes; it states also in detail the condition of the work of preparing the annual volumes in advance, and refers to the progress made in the investigations for the improvement of astronomical tables.

The superintendent mentions that delays have been experienced during the two past years in printing copies of the Nautical Almanac at times when they were most needed, which it is hoped the Department may find means to prevent hereafter.

Respectfully submitted.

WM. D. WHITING,
Chief of Bureau.

Hon. R. W. THOMPSON,
Secretary of the Navy.

OFFICE OF SUPERINTENDENT OF COMPASSES,
BUREAU OF NAVIGATION, NAVY DEPARTMENT,
Washington, October 15, 1879.

SIR: I have the honor to submit the following report for the current year:

During the past year, with the exception of such routine duty as has been presented, I have devoted my whole attention towards the completion of my work on nautical magnetics. As is well known to the bureau, I have been engaged in studies of this subject, including more especially the theory and use of the marine compass when subjected to the magnetic action of an iron ship, for a considerable number of years;

while, for several years past, when not otherwise occupied with the general duties of the office assigned me, I have been employed in the preparation of a manual thereon for the use of the Navy and commercial marine. Some delays have occurred from time to time from causes that need not be particularized in this place in the completion of this undertaking; but it is my present expectation to have the copy of the text and tables ready for the printer early in the coming spring.

In obedience to your order I have recently been in communication with the inventor of a proposed apparatus for determining the magnetic course of a ship, independently of any reference to the compass on board and, therefore, independently of any deviation of that compass caused by the iron of the ship. The means proposed to be employed for this purpose by the inventor are highly ingenious; but the question of the practical utility of such an apparatus will essentially depend on its ability to maintain its own directional relations with entire reliability, or at least within the limits of allowable error. Of this I have serious fears, under the varying circumstances of its use at sea, as detailed at some length in my correspondence with the inventor. A careful trial of the apparatus will, however, be requisite to settle some of these questions from a practical point of view.

I am, sir, very respectfully, your obedient servant,

B. F. GREENE,

Professor United States Navy, Superintendent of the Compasses.

Commodore WM. D. WHITING, U. S. N.,

Chief of Bureau of Navigation, Navy Department.

HYDROGRAPHIC OFFICE,
BUREAU OF NAVIGATION,
October 13, 1879.

SIR: In accordance with the Bureau's order of the 4th instant, I have the honor to submit a report of the operations of the Hydrographic Office for the past year.

During the fiscal year ending June 30, 1879, the following work was done in the drafting and engraving department:

I. WORK LEFT UNFINISHED IN THE PREVIOUS FISCAL YEAR.

The engraving of the unfinished sheets of the general chart of the South Pacific Ocean in eight half sheets has been completed with the exception of one sheet, which will be completed in a few weeks. Numerous new surveys by the different maritime nations having possessions on the shores of the Southern Pacific Ocean have been published during the compilation and engraving of these charts so that extensive additions and corrections have to be made on the plates before prints from them can be issued. These emendations are progressing rapidly.

The manuscript charts of the Indian Ocean in four sheets are subject to extensive corrections, owing to a new survey of the British possessions in the East Indies by the recently established Indian Marine Survey. The desire to avoid erasures in the new plates has retarded the progress of the engraving, but the manuscripts for the two upper sheets are in the hands of the engravers, those for the two lower ones being nearly finished.

The manuscripts for the four half sheets of the chart of the North Atlantic Ocean are also progressing rapidly, they being furnished to the engravers in parts, so that the drafting and engraving progress together.

As soon as these charts, with the chart of the South Atlantic Ocean, are completed, the office will be enabled to furnish to navigators new and carefully compiled charts of all the oceans, in place of the imperfect and nearly obsolete charts on various scales, from the plates purchased from E. and G. W. Blunt. These new charts will be on a uniform scale of six-tenths of an inch to a degree of longitude, a scale permitting their use in navigation close up to the coasts, and even into the larger channels, and considered the most advantageous for general use.

It has been necessary to defer the publication of a chart of the Mediterranean Sea in three sheets, owing to extensive surveys now in progress by the Italian, Spanish, and French Governments, the latter having undertaken the survey of the entire coasts of Algeria, Tunis, and Tripoli. As these surveys are now nearly completed, the work may again be taken in hand.

The engraving of the outline chart of the entire Mediterranean Sea has been finished.

A chart of the island of Guadeloupe has been so far engraved as to allow its preliminary use, and the mountain topography is now being inserted.

II. NEW WORK COMPLETED DURING THE YEAR.

Charts replacing those of the United States Exploring Expedition of the harbors of Pago-Pago and Allier Bay have been engraved and numerous additions from recent surveys have been made to the plates of other charts of the Wilkes' survey.

Twelve new charts, mostly sketches, were photolithographed, among which were the following from surveys by United States naval vessels:

The Tartar shoal, an important danger on the west coast of Mexico, surveyed by the United States steamer Tuscarora.

Cape Mount and the Sugury and Mahfah rivers on the coast of Liberia by the United States steamer Ticonderoga and the Gorringer bank off the west coast of Spain, discovered by the United States steamer Gettysburg.

Extensive additions and corrections from recent surveys have been made on the plates of the English and Irish channels.

The plates of the eastern coast of the United States purchased from E. and G. W. Blunt have been thoroughly overhauled and made to agree with the charts of the United States Coast and Geodetic Survey.

Deep-sea soundings made during the year by several of our naval vessels during their cruises, by the United States steamer Tuscarora on the west coast of Lower California, by the United States Coast and Geodetic Survey in the Gulf of Mexico and Caribbean Sea, and by foreign vessels, have been entered on all the charts affected.

Current corrections, such as changes in lights, buoys, &c., have been made on the greater number of the plates affected; on some of them nearly every week.

A complete series of projections for the Arctic Sea, north of Behring's Straits, and a number of tracings of Russian harbor charts, were furnished to the steamer Jeannette, commanded by Lieutenant De Long, U. S. N., as well as tracings and drawings to different branches of the Navy Department for various purposes.

III. WORK ENTERED UPON AND STILL IN PROGRESS.

A chart of the North Sea, in two sheets, is being engraved, mostly from photographic reductions of the charts published by the governments bordering on that sea.

The survey of the Amazon river from the sea to the mouth of the Madeira river, and of the Madeira river to the falls of St. Anthony, by Commander T. O. Selfridge in the United States steamer *Enterprise*, is being laid down in this office from the field books of the survey, and the plotting will be finished before January 1, 1880.

Photographic reductions to the scale thought best for publication are made as the plotting progresses, so that the engraving can be taken in hand as soon as means for it are appropriated.

Valuable assistance has been received from the United States Coast and Geodetic Survey in electrotyping plates, the charts of which are in constant demand, so that the plates which would otherwise be soon worn out are preserved for a long time.

The following volumes of sailing directions, &c., have been published during the past year:

Coasts and Islands of the Mediterranean Sea—Part III—by Lieut. Commander H. H. Gorringer and Lieut. S. Schroeder.

A list of Reported Dangers to Navigation in the Pacific Ocean—Part II—(numbering 1,302) compiled by Lieut. J. E. Pillsbury, U. S. N.

List of lights No. 1 on the east and west coasts of North America.

Lists of lights No. 2 on the south and east coasts of Africa and the East Indies.

List of lights No. 3 on the west coast of Africa and the shores of the Mediterranean Sea.

List of lights No. 4 on the Atlantic coast of Europe, the English Channel and North Sea.

Catalogue of charts, plans, and books published by the United States Hydrographic Office.

Besides supplying United States naval vessels with all charts, books, &c., required for purposes of navigation, 6,613 charts, and 1,016 books of sailing directions, &c., have been sold through the authorized agents, and the proceeds have been deposited to the proper credit in the United States Treasury.

As information has been received, "hydrographic notices" relating to discoveries and changes in the natural features of navigable regions and "notices to mariners" relating to changes in and additions to artificial aids to navigation (lights, buoys, &c.), have been published. The arrangement and publication of this information received from many sources, and in many languages, involves great labor and care. Among other sources of information this office is constantly exchanging publications with the hydrographic offices of England, France, Denmark, Sweden, Russia, Spain, Italy, Austria, Portugal, Holland, Belgium, Germany, India, Japan, Brazil, Buenos Ayres, and Chili.

The issue of these indispensable aids to navigation has steadily grown till now the yearly issue, when bound, forms two large octavo volumes and constitutes a complete synopsis of the hydrographic work of the world.

Until the present year these notices only contained matter relating to foreign waters and coasts, but since January 1, 1879, all information received from the United States Coast Survey, the United States Light-House Board, and other sources relating to the coasts of the United States, has been published in a similar manner.

One hundred and nineteen notices to mariners and eighty-seven hydrographic notices have been thus issued during the past year.

In the meteorological department of the office, recently under charge of Lieut. T. A. Lyons, and now in charge of Lieut. C. H. Judd, compilations have been made for the formation of meteorological charts of the North and South Atlantic Oceans, similar to those of the Pacific Ocean already issued. It will require another year to complete this work and have it ready for publication. As I stated in my last report, it is proposed to continue it until the whole surface of the navigable oceans is completed.

The merchant marine has very efficiently assisted in collecting data for the work, and a number of our journals which were issued to our vessels as blanks have been returned to the office filled with useful information.

The United States steamer *Tuscarora*, Commander J. W. Philip, has been engaged in the survey of the west coast of Mexico and has made excellent progress, having completed the work as far south as the gulf of Tehuantepec. Four coast sheets and fifteen plans of harbors have been received from Commander Philip, the plans being in most cases of harbors of which no chart has heretofore existed. These charts are all subject to the final corrections, which can only be made when the entire work is completed.

The very high character of the work done by Commanders Dewey and Philip on the coasts of Lower California and Mexico encourages the hope that Congress will make an appropriation for more extended surveys of the Pacific Ocean, the results of which would be of the greatest assistance to navigators, and I cannot too strongly urge that some steps may be taken to this end, in order that the numerous islands, rocks, and shoals which are now carried on the charts, the existence and positions of which are in many cases doubtful, should be accurately and finally determined.

Commander Schley of the *Essex* has rendered very valuable services to hydrography by his examination of the approaches to the Rio de la Plata, and by the zeal and energy which he has exhibited in making deep-sea soundings, and furnishing information for the benefit of navigators.

Lieut. Commander F. M. Green, with his assistants, Lieut. Commander C. H. Davis, Lieut. J. A. Norris, and Assistant Paymaster A. K. Michler, has successfully connected the chain of telegraphic longitudes measured from Lisbon to South America last year with the primary meridian of Greenwich, by exchanging time signals between Lisbon and Greenwich.

After completing this work Lieut. Commander Green returned home, and Lieut. Commander Davis, with the other officers, proceeded to complete the chain of measurements, by the exchange of signals between Rio de Janeiro, Bahia, and Pernambuco, and by the exact determination of the latitude and longitude of Para.

This work, by instruments and methods eminently American, has fixed with unexceptionable accuracy nine secondary meridians, including the longitudes of three important national observatories, Lisbon, Rio de Janeiro, and Cordova, about the exact positions of which some uncertainty has existed.

It is very desirable that when time and opportunity permit, these observations should be extended and continued. With the wide and increasing extent of submarine cables and land telegraph lines, there is every reason to expect that the uncertainty attending the longitudes of remote points will soon cease to exist.

Since my last report a department of longitudes has been organized

in addition to the other departments of this office, its object and duties being to verify all geographical positions, data for which may be received by the office from all sources, and to make and keep an accurate list of latitudes and longitudes of all points on the coasts of the world, as far as they can be ascertained.

The charge of this department has been given to Lieutenant-Commander F. M. Green, who, from long connection with similar duties, is eminently fitted for it.

While the importance of the Hydrographic Office has been continually increasing and the work upon which it is engaged has been growing from year to year, the appropriations for its support have remained the same, so that but little remains of its funds for the publication of new charts after the current expenses of the office are defrayed.

As the object in establishing the office was to render this country independent of all others as regards charts and sailing-directions, it is very desirable that the appropriations should be increased, or that some other method of reproducing our publications should be adopted which would be economical and at the same time efficient, so that by the time our commerce will attain that position among the nations to which it is entitled we may be independent of them by being able to furnish all desired hydrographic information from our own publications.

Very respectfully, your obedient servant,

S. R. FRANKLIN,

Captain, U. S. N., and Hydrographer.

Commodore W. D. WHITING,

Chief of the Bureau of Navigation, Navy Department.

NAVY DEPARTMENT,
BUREAU OF NAVIGATION, SIGNAL OFFICE,
Washington, October 23, 1879.

SIR: In compliance with the order of the Bureau of Navigation of the 6th instant, addressed to this office, I have the honor to submit the following report of the operations of the Signal Office during the past year:

On the 1st of May, 1879, I was placed in charge of the duties of this office, relieving Commodore J. C. Beaumont.

During the months of November and December, official experiments were carried on at Annapolis under the direction of the Bureau of Navigation with a view to determine the relative merits of several systems of night signals. The report of the board was in general in favor of the system submitted by Lieut. E. W. Very, and experiments are now in course of prosecution for the purpose of modifying this system and rendering it thoroughly practical.

Several inventions pertaining to signals that had been developed by my predecessor, Commodore Beaumont, and also several suggestions of minor importance made by foreign governments, have been examined, tested, and reported upon during the year.

The regular instruction of officers and men in the system of day and night signaling have been carefully attended to, and the quarterly reports during the year show a very satisfactory amount of progress.

The international code of day signals adopted by the Navy in 1873 having now come into general use throughout the world, and being used constantly at sea as a means of communicating intelligence, I would respectfully recommend that the scope of signal instruction be

enlarged so as to include a thorough instruction of officers and men in the names and use of flags of this code.

Respectfully submitted.

C. H. WELLS,
Captain and Chief Signal Officer.

Commodore W. D. WHITING, U. S. N.,
Chief of Bureau of Navigation.

UNITED STATES NAVAL OBSERVATORY,
Washington, October 20, 1879.

SIR: In submitting the following report of the operations of the Naval Observatory during the past year, I beg leave strongly to recommend the removal of the institution to a better site.

The present grounds are malarious; the river fogs obscure the vision, rendering it less clear than in a position more removed from the water.

When the contemplated improvements are made on the river front, which seem only the question of a short time; when the marsh partly encircling the observatory is filled in, and the hill on which the buildings rests is used as a top-dressing to the land thus acquired, this part of the city will be the center of its water commerce; and its value to the government will be greater than the cost of a new situation for the Observatory.

It thus seems that when the hill is cut down, the selection of a new site will be imperative. It will be better to select this new site now, for the cost will be greater in the future.

THE 26-INCH EQUATORIAL.

The observers on this instrument have been the same as in the preceding year, namely, Prof. Asaph Hall, in charge, and Prof. Edward S. Holden, assistant. Mr. George Andersson is employed in the dome. Since last February, Professor Holden's time has been chiefly occupied with his duties as librarian.

This instrument is now in good order, and is in constant use. The principal work done with it by the astronomers during the year is as follows:

The satellites of Saturn, Japetus, Hyperion, and Titan, were observed by Professor Hall until December 24, 1878. The inner satellite, Mimas, was also observed by Professor Holden on eleven nights, and by Professor Hall on four nights. We have now accumulated a large number of observations of the three outer satellites of Saturn; and these observations ought to be completely reduced and discussed for the purpose of determining more accurately the orbits of these satellites and the mass of the planet.

A few observations of the satellites of Uranus were made by Professor Holden during the last opposition of this planet.

The principal series of observations with this instrument are the observations of double stars by Professor Hall. The thirty stars selected by Struve for the comparison of micrometrical measurements by various observers, have each been observed eight nights, on an average. It was found best not to make the same number of observations of all the pairs, but to increase this number in the case of the more difficult stars. Fewer observations have been made, consequently, of the pairs where the distances are large and the measurements are easy; while in case of diffi-

cult pairs, where the components are close and differ much in magnitude, the number of observations has been increased. This work may now be considered as finished, though it may be necessary to add a few more observations of some of the pairs. In the future, it will probably be best to confine the observations to a few stars of large declinations which can be observed at all hour angles.

In August last, the Naval Observatory was honored by a visit from the distinguished director of the Pulkowa Observatory, Mr. Otto Von Struve, and his son, Mr. Hermann Struve, who came for the purpose of examining our large telescope, with the view of purchasing a still larger one for the Imperial Observatory at Pulkowa. I am happy to say that the performance of our telescope was found satisfactory by so competent and experienced a judge, and that Mr. Struve has ordered a 30-inch objective from Messrs. Alvan Clark & Sons, the makers of our instrument.

THE TRANSIT CIRCLE.

This instrument, under the direction of Prof. J. R. Eastman, assisted by Prof. Edgar Frisby, and Assistant Astronomers A. N. Skinner, H. M. Paul, and H. S. Pritchett, has been employed in observations of—

1. Stars of the American Ephemeris, for clock and instrumental corrections.

2. Sun, moon, major and minor planets.

3. Stars whose occultations were observed in connection with observations of the transit of Venus, in 1874.

4. Standard stars for a catalogue of zone observations.

5. Stars of the British Association Catalogue, between $120^{\circ} 0'$ and $131^{\circ} 10'$ N. P. D.

6. Stars used in observations of comets with the 26-inch and 9.6-inch equatorials.

7. Stars used in the determination of latitude by the United States Coast and Geodetic Survey, the Lake Survey, Capt. G. M. Wheeler's Survey, and by Lieut. Commander F. M. Green, in surveys in the West Indies.

8. Stars used by Mr. David Gill, of the Royal Astronomical Society of London, in determining the solar parallax from observations of Mars with the heliometer.

The whole number of observations made with the transit circle since the last annual report is 4,100. Of these observations, 81 were of the sun; 61 of the moon; 130 of the major planets; and 146 of the minor planets.

The annual volume for 1875 has been issued since the last report, and the volume for 1876 is now in press. The work of the transit circle is now being prepared faster than it can be printed with the means furnished.

The transit-circle work for 1877 is nearly finished. The observations of 1878 are nearly all reduced to apparent place; and the reductions of the observations of 1879 are well advanced.

In the reduction of the transit-circle observations efficient assistance has been rendered by Lieut. E. W. Sturdy, U. S. N., from April 30 to October 26, 1878, and by Lieut. E. Longnecker since November 2, 1878.

THE 9.6-INCH EQUATORIAL.

This instrument is under the direction of Professor Eastman, who has the same assistants as are on the work with the transit circle.

It has been employed in the observations of comets and occultations, and in determining the approximate corrections to the ephemerides of such small planets as are not readily found with the transit circle.

The meteorological department is under the direction of Professor Eastman; and the usual observations, at intervals of *three hours*, beginning at midnight, have been made throughout the year, by the watchmen, Messrs. Hays, Horigan, and Cahill.

The control of the system of wires within the Observatory, connected with the central switch-board, and of the connections with the wires of the Western Union Telegraph Company, is under the direction of the officer in charge of the transit circle; while the immediate charge of all the batteries, wires, and their connections, is confided to Mr. William F. Gardner, the instrument-maker. The connections for astronomical work within the buildings remain substantially the same as during the past year. Outside of the Observatory, this department is responsible for the control, by means of the motor clock, of several clocks in the State, War, Navy, and Treasury Departments; for furnishing accurate time-signals to the Western Union Telegraph Company, and for dropping the time-ball on the Western Union telegraph-office in New York.

The facilities for controlling the clocks in the departments are now wholly inadequate, and a complete change will soon be made, which, it is hoped, will insure thorough and continuous control.

A change also in the method of transmitting time-signals and of dropping the Washington and New York time-balls is nearly completed, and will probably be in operation by the end of October.

PHOTOHELIOGRAPHIC AND MISCELLANEOUS WORK.

Prof. William Harkness has been assisted during the year by the following named gentlemen: Lieut. T. Dix Bolles, from October 16, 1878, till the beginning of September, 1879; Lieut. Thomas Perry, from November 9, 1878, till the end of July, 1879; Mr. Joseph A. Rogers, from March 11, 1879, till the present time; and by Master E. F. Qualtrough, since September 22, 1879. The work accomplished is as follows:

The photographs of the late transit of Mercury were examined, and out of the whole number it was found that twenty-five of the Cambridge pictures, twenty-three of the Washington pictures, and sixty-four of the Ann Arbor pictures, were sufficiently well defined for measurement.

Accordingly, these one hundred and twelve plates have been read off, all but twelve being done in duplicate; and the computations, also in duplicate, have been carried so far as to give for the Cambridge and Washington plates the altitudes and azimuths of the reflected images of the Sun and Mercury. The computations of the Ann Arbor photographs are nearly in the same state of forwardness, but are suspended at present because the reticule-plate used in making the pictures has not yet been returned to this Observatory for the determination of its thickness and refractive index. Tables have also been prepared, giving for each of the three stations, at intervals of five minutes of time, 1st, the corrections in altitude and azimuth for the differential refraction between the centers of the Sun and Mercury; 2d, the position angle, upon the reflected image of the Sun, of the meridian passing through the center of the true sun; and 3d, the differential coefficient of the variations produced in that angle by small changes in the altitude and azimuth of the reflected image of the Sun. About three months' work is yet required to determine from the

photographs the final corrections to the right ascension and declination of Mercury.

The observations of Mercury made by Professor Harkness at Austin, Tex., have been completely reduced, and are published in Appendix II to the Washington Observations for 1876. The observations made in connection with the solar eclipse of July 29, 1878, at Creston, Wyo., have also been reduced, but have not yet been put in shape for publication.

The drawings of Mars, made by Professor Harkness during the opposition of 1877, have been transformed from the orthographic to Mercator's projection, and a map of the planet has been constructed. General tables have also been computed, which give directly the areographic latitude and longitude of the center of the disc of Mars and the position angle of its axis, as seen from the earth; the arguments being the geocentric right ascension and north polar distance of the planet. As Mars, after the present year, will not approach so closely to the earth for a long time, it has been thought best to defer the completion of this work until the results of the coming opposition can be embodied in it.

Mr. Joseph A. Rogers has been employed under a special appropriation for experiments in astronomical photography, and has spent most of his time in endeavoring to overcome the uncertainties of the emulsion process. In the prosecution of this work he has prepared about fifty samples of emulsion. Here it may be well to remark that our success in photographing the total eclipse of the sun of July, 1878, was largely due to the excellence of the emulsion which he furnished; and the future of astronomical photography seems to a great extent dependent upon the emulsion process. Hence the importance of the experiments in which Mr. Rogers is engaged. He has also photographed the sun on every clear day, and has made numerous copies of the negatives of the corona taken during the eclipse mentioned above.

Among the minor work of the year may be mentioned the contouring of the Observatory grounds at intervals of five feet, and the examination, by means of the measuring engine, of two of the micrometer screws belonging to the 26-inch equatorial.

THE LIBRARY.

The library was placed in charge of Prof. Edward S. Holden on February 10, 1879. Almost his entire time since that date has been spent on the work connected with it, to the virtual exclusion of astronomical work proper. It is now in a satisfactory condition, and can be maintained in order by a continuance of the present system.

The books have been rearranged and bound, the pamphlets collected and arranged by subjects, and the meteorological periodicals found, sorted and made available for consultation.

A card catalogue has been begun, and over 4,000 cards made. Part I of the catalogue of the library, "Astronomical Bibliography," will be printed in 1879.

A complete index to the publications of the Observatory from 1845 to 1875 has been made. It will be printed as Appendix I to the Observations for 1876. At intervals of ten years, similar indexes should be made.

Over 8,500 volumes of our publications have been distributed in the eight months and a half since February; that is about 1,000 per month, or 39 per working day, on the average. The arrears have been completely brought up.

The distribution of these volumes in the United States is done under the frank of the department; in foreign countries, through the agents of the Smithsonian Institution. A sum of \$113.85 has been asked for in the estimates to repay the Smithsonian Institution for transportation expenses already incurred.

The usual annual appropriation of \$1,000, for the purchase and care of astronomical works, should be continued.

In this connection, it may be said that our library is now the best astronomical library in the United States, and is constantly appealed to by persons not connected with the Observatory. It is highly desirable that it should be still further increased, and that this valuable collection, which, if destroyed, could hardly be replaced, should be safely lodged in a fire-proof room.

CHRONOMETERS.

There are at the present time in the chronometer-room one hundred and ten mean-time chronometers; twenty are ready for issue, twenty-six are on trial, and sixty-eight need repairs. There is also one sidereal chronometer.

Messrs. Negus, of New York, have in their hands twenty-eight chronometers for cleaning and repairs.

Fifty-seven chronometers have been received during the year, and seventy-four have been issued; of these, twenty-eight have been issued to vessels of the Navy and thirty-six sent to Messrs. Negus for repairs.

There are also ninety-five condemned chronometers stored away, and the best of these are kept in repair to be used as "hacks."

The thirteen chronometers captured on the steamer Florida are stored away in the chronometer-room.

Three gold comparing watches and five silver watches are on hand, all of which are out of repair.

A time-ball on the tower of the Western Union Telegraph Company's main building, in New York City, is dropped daily at New York noon (except Sunday), from the chronometer-room.

During the year this ball has failed to drop eight times—three, because wires were out of order at New York; once, on account of the wire insulation here having been destroyed by lightning; three times here, because of the mean-time clock having stopped, and the changing of wires while putting in new instruments and telephones; and once, for which no cause could be found for its not working.

At Washington, noon, a time-ball is dropped from the staff on the dome of the Observatory, and time signals are transmitted to all parts of the United States.

The following paper, by Prof. Simon Newcomb, secretary of the Transit-of-Venus Commission, and charged with the preparation of the report, is herewith appended.

NAUTICAL ALMANAC OFFICE,

NAVY DEPARTMENT,

Washington, D. C., October 13, 1879. •

DEAR SIR: In compliance with your request of October 9, I beg leave to report that the reductions of the transit of Venus work are in the following state:

Part I, containing a general discussion of the observations, so far as to deduce equations of condition from them, is ready for the press, except a few touches here and there, some of which it may be desirable to have acted on by the entire commission.

Part II, containing the reports of the observers and the observations made at the several stations, is also nearly ready, so far as I have the material. The observations at four of the stations were reduced by the observers themselves, and are therefore not completely in my possession, while those which are, need some modifications.

Part III, containing the discussion of the longitudes of the stations, from occultations and other sources, is still incomplete, and requires some examination from me, which I shall be unable to give it for two or three months to come. The reduction of the chronometer observations for longitude is in the hands of Professor Harkness; I am, therefore, unable to report upon their progress.

Part IV, which should contain the photographic plate measures, is also in the hands of Professor Harkness.

Very respectfully, your obedient servant,

SIMON NEWCOMB,
Superintendent Nautical Almanac.

Rear-Admiral JOHN RODGERS,
Superintendent Naval Observatory, Washington, D. C.

I have the honor to be, very respectfully, your obedient servant,
JOHN RODGERS,
Rear-Admiral, Superintendent.

Commodore WILLIAM D. WHITING, U. S. N.,
Chief of the Bureau of Navigation, Navy Department.

NAUTICAL ALMANAC OFFICE,
BUREAU OF NAVIGATION,
Washington, D. C., October 18, 1879.

SIR: I have the honor to submit the following report of the operations of this office during the past year:

The American Nautical Almanac for the year 1882, containing that portion of the Ephemeris necessary for navigators, was issued in July last. The large Ephemeris for 1882 has been delayed by the numerous alterations made in the work, but is now ready for the press. Of the Ephemeris for 1883, 75 pages are now in type and the printing is progressing favorably.

During the fiscal year ending June 30, 1879, 368 copies of the large Ephemeris were sold and 751 copies were distributed for the public service and for scientific and educational purposes. Of the Navigators' Almanac, 3,210 copies were sold.

In this connection I would respectfully ask the attention of the Bureau to the great inconvenience which has resulted during the past two years from the inability of the Department to print copies of the American Nautical Almanac at the times when they are required by merchant ships. By having issued this necessary manual for more than a quarter of a century, and by having made such arrangements that it has nearly superseded all others in the market, it might be reasonably claimed that the government has assumed the obligation of not allowing it to get out of print while wanted by ships going to sea. But under present arrangements there is annually a period of from one to three months during which this office is unable to supply the demand. The subject is, therefore, submitted for such action as the Bureau may deem proper under the circumstances.

SYSTEM OF COMPUTATION.

The plan has been adopted of devoting the appropriation for each fiscal year to the preparation of a special volume of the Ephemeris to be printed during the fiscal year following. The arrangement is such that the computations of the Ephemeris for the year 1884 shall be completed with the appropriation for the year ending June 30, 1880, and that the Ephemeris itself shall be printed during the year following, so as to be ready for issue by June, 1881. The ephemeris of the sun, and a portion of that of the moon, has to be prepared a year in advance of the rest of the Ephemeris, being needed in computing the latter.

Under the system heretofore adopted in the preparation of the Ephemeris two-thirds of the computations are made in various parts of the country by college professors and mathematicians having other vocations. In the case of the more complex computations, especially those of the planets, this system is subject to several inconveniences and renders it extremely difficult for this office to exercise the proper control over the accuracy of the work. I am, therefore, of opinion that the efficiency of the office will be promoted by having all the planetary ephemerides prepared by a single expert computer under its immediate direction.

IMPROVEMENT OF THE TABLES.

Besides the regular routine of preparing and issuing the two Ephemerides, progress has been made in the several investigations for improving the astronomical tables referred to in my last annual report.

Mr. Hill's work on the motions of Jupiter and Saturn has proved more laborious than was expected; but I still anticipate its completion during the year 1880.

The general catalogue of all the stars used in the preparation of the Ephemeris is nearly completed by Master Chauncey Thomas, United States Navy, with aid from the other naval officers attached to the office.

The work of comparing Hansen's tables of the moon with observations since 1750 is fairly under way. The tabular places of the moon necessary for the reduction of occultations have been computed, and are now being duplicated to avoid error. A large mass of computations performed by Prof. James C. Watson, for the United States Coast Survey, has been courteously turned over to the office by that establishment, to be utilized in this work.

Hansen's formulæ for the motion of the moon have not been accurately compared with those of other investigators, owing to the very different form in which the author presents them. I have, therefore, prepared the formulæ of transformation for reducing them to the usual form, and the work has been successfully executed by Mr. John Meier. The results will be ready for the press as soon as checked and arranged.

The tabular times of eclipses of Jupiter's first satellite from 1668 to 1815 have been computed from Damoiseau's tables, with a view of comparing them with observations.

Tables of solar eclipses for the easy and rapid computation of the eclipses of the sun during the historic period have been prepared and issued during the year.

It is desirable to prepare and issue all investigations of this class in detached completed parts, in order that the mass of unfinished work may always be as small as possible. I anticipate that the office work upon them will now be conducted with as much regularity as is possible

under the circumstances, and respectfully submit to the Department the question of providing for their regular printing.

Very respectfully, your obedient servant,

SIMON NEWCOMB,
*Professor, United States Navy,
Superintendent Nautical Almanac.*

Commodore WILLIAM D. WHITING, U. S. N.,
Chief Bureau Navigation, Navy Department.

*Estimate of appropriations required for the service of the fiscal year ending June 30, 1881, by
the Bureau of Navigation.*

FOR THE SUPPORT OF THE BUREAU OF NAVIGATION.

For salary of chief clerk (Revised Statutes, page 69, section 416, and act of June 21, 1879)	\$1,800 00
For salary of one clerk of third class (Revised Statutes, page 26, section 167, and act of June 21, 1879)	1,600 00
For salary of one clerk of second class (act of June 21, 1879)	1,400 00
For salary of assistant messenger (act of June 21, 1879)	720 00
For salary of laborer (act of June 21, 1879)	660 00
For contingent expenses (act of June 21, 1879)	800 00
Total	6,980 00

A.

I.—FOR NAVIGATION.

For foreign and local pilotage and towage of ships of war	\$45,000 00
For services and materials for correcting compasses on board ship, and for adjusting and testing compasses on shore	3,000 00
For nautical and astronomical instruments, nautical books, maps, charts, and sailing directions, and repairs of nautical instruments for ships of war	9,000 00
For books for libraries of ships of war	2,000 00
For Navy signals and apparatus, namely, signal-lights, lanterns, rockets, running-lights, drawings and engravings for signal-books	6,000 00
For compass fittings, including binnacles, tripods, and other appendages of ships' compasses	3,000 00
For logs and other appliances for measuring the ship's way, leads and other appliances for sounding	3,000 00
For lanterns and lamps and their appendages, for general use on board ship, including those for the cabin, ward room, and steerage, for the holds and spirit room, for decks and quartermasters' use	5,000 00
For bunting and other materials for flags, and making and repairing flags of all kinds	4,000 00
For oil for ships of war other than that used in the engineer department, candles when used as a substitute for oil in binnacles and running-lights; for chimneys and wicks, and soap used in the navigation department	20,000 00
For stationery for commanders and navigators of vessels of war and for use of courts-martial	1,500 00
For musical instruments and music for vessels of war	1,000 00
For steering signals and indicators, and for speaking-tubes and gongs for signal communication on board vessels of war	2,000 00
Total	104,500 00

II.—FOR NAVIGATION CONTINGENT.

For freight and transportation; postage and telegraphing on public business; advertising for proposals; packing boxes and materials, and all other contingent expenses	\$2,000 00
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III.—FOR NAVIGATION.—CIVIL ESTABLISHMENT.

For civil establishment in the navigation departments of the several navy-yards, namely:

Portsmouth	\$1,300 00
Boston	1,400 00
New York	1,400 00
League Island	1,300 00
Washington	1,400 00
Norfolk	1,300 00
Pensacola	1,017 25
Mare Island	1,300 00
Total	10,417 25

IV.—FOR NAVIGATION.—HYDROGRAPHIC WORK.

For drawing, engraving, printing, and photolithographing charts; purchase of chart paper; correcting old plates; preparing and publishing sailing directions, and other hydrographic information	\$40,000 00
For fuel and office furniture; care of building and other labor; purchase of books for library; drawing materials and other stationery; postage, freight, and other contingent expenses	6,000 00
Total	46,000 00

B.

I.—FOR NAVAL OBSERVATORY.

For pay of three assistant astronomers, at \$1,500 each	\$4,500 00
For pay of one clerk	1,600 00
For one instrument maker, three watchmen, one messenger, and one porter; for keeping of buildings and inclosures; fuel, light, and office furniture; chemicals for batteries; stationery, freight, and all contingent expenses	12,000 00
For reducing and transcribing astronomical and meteorological observations for publication	2,200 00
For the purchase and care of professional books and periodicals for library	1,000 00
For solar and stellar photography	1,000 00
Total	22,300 00

C.

I.—FOR NAUTICAL ALMANAC.

For pay of computers and clerks for preparing for publication the American Ephemeris and Nautical Almanac	\$19,000 00
For rent, fuel, labor, stationery, boxes, expressage, books, and miscellaneous expenses	1,500 00
For ephemeris of new planets, discovered by American astronomers	2,000 00
Total	22,500 00

RECAPITULATION.

Estimate of appropriation required for the fiscal year ending June 30, 1881, by the Bureau of Navigation, Navy Department.

FOR SUPPORT OF BUREAU.

Salaries and contingent	\$6,980 00
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FOR THE NAVAL SERVICE.

A. I.—Navigation	\$104,500 00
II.—Navigation contingent	2,000 00
III.—Navigation, civil establishment	10,417 25
IV.—Navigation, hydrographic office	46,000 00
B. I.—Naval Observatory	22,300 00
C. I.—Nautical Almanac	22,500 00

Total **207,717 25**

Abstract of offers for supplies received for furnishing articles coming under the cognizance of the Bureau of Navigation.

6,000 gallons lard-oil—bureau's order February 12, 1879.

	Cents.
* N. K. Fairbank & Co	per gallon..... 56 ⁴⁴ / ₁₀₀
James Symington	per gallon..... 58 ⁴⁴ / ₁₀₀
James H. Walker	per gallon..... 58
John H. Pool & Macy	per gallon..... 59
Manhattau Oil Company	per gallon..... 57 ²⁷ / ₁₀₀

10,000 gallons lard-oil—bureau's order June 27, 1879.

	Cents.
Manhattan Oil Company	per gallon..... 49 ⁴⁸ / ₁₀₀
* N. K. Fairbank & Co	per gallon..... 49 ⁴⁸ / ₁₀₀

No. 6.—BUREAU OF YARDS AND DOCKS.

BUREAU OF YARDS AND DOCKS,
NAVY DEPARTMENT,
Washington, D. C., October 23, 1879.

SIR: In compliance with your order of the 3d instant, I have the honor to submit herewith my annual report for the fiscal year ending 30th June, 1879, and estimates for the fiscal year ending 30th June, 1881, together with an abstract of offers for supplies coming under the cognizance of the Bureau of Yards and Docks for the fiscal year ending 30th June, 1879.

I am, with great respect, your obedient servant,

R. L. LAW,
Chief of Bureau.

Hon. R. W. THOMPSON,
Secretary of the Navy, Washington, D. C.

BUREAU OF YARDS AND DOCKS,
NAVY DEPARTMENT,
Washington, D. C., October 23, 1879.

SIR: In obedience to your order of the 3d instant, I have the honor to submit the annual report of this bureau and the expenditures for the fiscal year ending June 30, 1879.

I also submit estimates for the fiscal year ending June 30, 1881. These estimates have been carefully revised, and are considered as low as the wants of the bureau require.

The intention of the bureau is to build and repair chiefly for immediate wants, yet looking to the requirements of the future. In building, the object should always look to permanency. Wooden buildings are not suitable or economical in navy-yards, and invariably entail a cost far beyond what good brick or stone structures would cost, to say nothing of the danger from fire.

In the last fiscal year no special appropriations were made except \$75,000 for stone dry-dock at Mare Island and \$20,000 for repair of rope-walk at Boston. These sums have been expended very economically. Much work has been done on the dry-dock considering the small amount

appropriated for its continuance, although a large portion of the appropriation has been spent in purchasing materials.

The ropewalk at Boston has been repaired for the sum appropriated, and this important structure, it is thought, will last for many years to come.

The amount appropriated for "repairs and preservation," though judiciously and frugally expended, has proved inadequate to the wants and requirements of the several navy-yards and stations.

The store and ship houses, workshops, docks, &c., are going to decay for the want of means to preserve them.

The bureau has only been able to make temporary repairs in most cases, and when it is considered there are over three hundred buildings, most of which are large and very costly, and in addition to these the wharves and docks, requiring more or less repairs every season, it becomes apparent that the amount appropriated is insufficient. Every rain-storm and gale of wind calls for further expenditure, and the result is that the means allotted are frittered away, whereas were ample funds provided much could be saved.

The remarks under the heads of the various yards and stations will inform you in detail of their condition and wants.

PORTSMOUTH, N. H.

The work at this yard has been confined to preservation; no new works or extensive repairs have been undertaken except that of the dry-dock. An examination showed that it required a thorough overhauling to make it serviceable. A quantity of decayed timber has been removed and replaced with new, and the dock calked inside and out and repainted.

In carrying on this work the dock has been always ready for service, and the great expense incurred has absorbed so large a portion of the means appropriated for general repairs, that the bureau has been unable to do other necessary work.

Some old wooden sheds, causing constant apprehension of fire, have been removed, but this leaves valuable material exposed to the weather.

I submit estimates for the following objects of improvements at this navy-yard, viz:

For foundry for steam engineering	\$17,462 22
For smithery for steam engineering	7,926 25
For water works	7,000 00
Total estimate	32,388 47

BOSTON, MASS.

For this yard an especial appropriation was made for repairing the ropewalk. The work has been well done, and the walk is in good condition, and will be serviceable for many years to come.

The other repairs have consisted in keeping the roofs, gutters, &c., of the yard buildings in order. In this, as in many of the yards, there are small wooden sheds and shops inviting fire and destruction to property of great value. Several of these have been removed, but it is necessary for the interests of the service that proper buildings be erected ere the remainder are torn down.

The present caisson and gates of the dry-dock have been in use for over forty-six years, and need renewing; the gates are deteriorated beyond use, and the caisson nearly so. As the use of the dry-dock de-

pend upon these adjuncts, I recommend a small appropriation for the renewal of the same.

I submit estimates for the following objects of improvements at this navy-yard, viz :

For yards and docks workshop.....	\$10,000
For paving and grading	10,000
For cart-shed	7,000
For new gate for dry-dock	30,000
Total estimate	87,000

NEW LONDON, CONN.

At this station no repairs of moment have been made. The buildings have been repaired as required.

I submit the following estimate, viz :

For grading	\$5,000
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SACKET'S HARBOR, N. Y.

At this station there is a ship-house with the frame of a line-battle-ship in it; both are decaying and falling to pieces. During a heavy gale lately a part of the roof of the building was blown in, and the rest may be expected to follow during the coming winter. Should the department propose to repair the building, a survey should be held immediately and the work executed as soon as possible.

BROOKLYN N. Y.

The estimates for this yard are for purposes that are considered of great moment.

The timber-shed would save its cost in a few years.

The estimate for the yard wall is heartily approved, and will save cost, labor, and material far beyond the expense. The same may be said of the estimate for a coal depot.

The improvements in this yard, with the limited means supplied, show attention and care on the part of the officers in charge in the disbursement of the funds greatly to their credit.

I submit estimates for the following objects of improvement at this yard, viz :

For shipwrights' shed and oakum store.....	\$10,000
For timber-shed	5,000
For yard wall, Flushing and Washington avenues	5,000
For coal depot.....	20,000
Total estimate	40,000

LEAGUE ISLAND, PA.

The storm of October 17, 1878, caused great damage at this station. The dykes at various places, amounting in all to about 1,400 feet in length, were washed away, and the whole island, except a small portion, filled in for roadways and buildings, was submerged to the depth of 3 to 7 feet. A large quantity of material was swept away and the lives of the employes seriously exposed.

As there were no funds to repair the dyke, beyond the amount granted for repairs of all the yards, the bureau was obliged to refuse almost abso-

lute necessities to other yards, in order to rescue League Island; though taking freely from the funds allotted to other yards, the bureau has been unable to do more than repair the dykes temporarily.

The estimate submitted for further improvement is very small considering the work to be done to make the place perfectly secure.

Further estimates for improvements are submitted for absolute necessities if the yard is to be utilized.

I submit estimates for the following objects of improvement at this yard, viz:

For foundry for steam-engineering	\$30,000 00
For dredging and filling in	75,000 00
For grading, graveling, &c.	5,000 00
For improvement of dykes	60,000 00
For masting sheers	12,000 00
For finishing docking apparatus and mold loft	10,000 00
Total estimate	192,000 00

WASHINGTON, D. C.

The work in this yard has consisted of repairs and improvements to officers' quarters, workshops, wharves, roads, &c. You will observe that no special appropriation is suggested by the commandant except for the purchase of a lot near the western boundary of the yard, the purchase of which will add greatly to the accommodations in that quarter.

The bureau commends this yard for its good order, efficiency, and very marked economy in the expenditures.

Your attention is respectfully called to the importance of improving the Eastern Branch of the Potomac. Several thousand dollars have been appropriated in the last two years for deepening the Potomac from Georgetown down to near Alexandria, but not a dollar for the Eastern Branch. Each year adds to the labor, danger, and expense of getting ships of very moderate draught to and from the yard. It is suggested that piles be placed above Uniontown Bridge to deflect and narrow the current so that the increased velocity will deepen and keep an open deep channel to the Potomac proper.

The bureau advances no opinion as to whether the channel should be deepened by dredging or as above noted.

I submit the following estimate for this yard, viz:

For purchase of square No. 853	\$12,604 70
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NORFOLK, VA.

Owing to the heavy gale of wind and rain at this place in August last, great damage was done to the buildings, wharves, roadways, &c. An extraordinary expenditure of about \$12,000 was required to repair the dilapidation. The damage sustained has not yet been made good; the means allowed have been expended with great care, and in a few days it is supposed the yard will be in fair order.

During the year ending June 30, 1879, repairs have been made on buildings, wharves, roadways, &c., as required. The allotment to this yard is too small to allow extensive work, even in repairs.

This yard, situated in a climate that permits work the entire year, with a harbor that can be entered by our heaviest-draught ships, with easy access by rail and water to our great coal and iron mines, calls for the special attention of Congress as a naval station.

I submit estimate for the following objects of improvement, viz :

For timber-shed No. 32	\$40,925 26
For timber-shed No. 33	40,925 26
For coal-house No. 54	30,000 00
For two cisterns	9,485 00
For chain and cordage store No. 63	5,000 00
Total estimate	126,335 52

PENSACOLA, FLA.

At this yard no work has been done beyond keeping wharves, bridges, and buildings in repair. Estimates for necessary improvements are herewith submitted :

For timber-shed No. 11	\$28,590 03
For spar and cooper-shop No. 38	38,030 79
Total estimate	66,620 82

MARE ISLAND, CAL.

As the bureau was confined to the usual appropriations for repairs, no work has been undertaken at this yard. The special appropriation of \$75,000, for dry-dock was expended with very marked advance in the work. I beg leave to renew my observations as to the great and grave necessity of such a sum being appropriated as will permit the entrance to the dock to be advanced beyond the danger that arises from the wooden coffer-dam giving way, the liability of such disaster increasing daily.

The floating dry-dock is a source of constant care and expense. The bureau was called upon for \$45,000 during the year for repairing the same, and to procure the means in part to meet this emergency the bureau has been compelled to omit necessary repairs at other yards. At present writing the bureau has authorized the expenditure of \$5,000 for commencing repairs on this dock, and either the dock must be given up, or means taken from other funds to complete the repairs.

Estimates submitted are deemed necessary for keeping the yard in a proper state to repair the naval ships in the Pacific Station.

I submit estimates for the following objects of improvement at this yard, viz :

For continuation of stone dry-dock	\$400,000 00
For roads and pavements (stone)	10,000 00
For renewing plank-road	1,000 00
For extension of timber-shed No. 94	10,000 00
Total estimate	421,000 00

KEY WEST, FLA.

At this station during the past fiscal year slight necessary repairs have been made to the buildings and shops, and the wharf almost entirely renewed.

I submit estimates for the following objects of improvement at this station, viz :

For sea-wall and filling in front of storehouse	\$7,000 00
For commencing permanent bulkhead of concrete	5,000 00
For erection of double house for officers' quarters	4,000 00
Total	16,000 00

NAVAL ASYLUM, PHILADELPHIA, PA.

On the 1st July, 1878, there were 13 officers, 29 attendants, and 149 beneficiaries on the rolls of the asylum.

During the fiscal year ending 30th June, 1879, 36 beneficiaries have been admitted, 10 have died, 6 have been dismissed for misconduct, and 2 were discharged at their own request.

Under the administration of the present able governor this institution has been kept in admirable condition, and everything has been done to render the condition of the beneficiaries as comfortable as possible.

The expenditures during the fiscal year ending 30th June, 1879, have been—

For pay and pocket-money of beneficiaries	\$3,353 22
For tobacco	1,222 87
For clothing, boots and shoes	7,485 43
For subsistence	16,212 14
For paints, dry goods, lumber, coal, wood, provender, hardware, miscellaneous, and house sundries	6,825 44
For pay of employes	7,886 63
For repairs and preservation of all kinds	4,424 81
For water rent and gas	1,767 60
For cemetery and burial expenses	337 69
For improvement of grounds	499 60
For car tickets	81 00
For ice	162 89
Total	50,259 32

Estimates have been submitted by the governor of the institution for its support during the fiscal year ending 30th June, 1881, amounting in the aggregate to \$79,465.

Accompanying this report is an abstract of offers for supplies received for furnishing articles coming under the cognizance of the Bureau of Yards and Docks, made in conformity to act of Congress approved March 3, 1843.

By direction of the department I respectfully submit the following estimates for the fiscal year ending 30th June, 1881:

Sheet No. 1. For support of Bureau of Yards and Docks	\$12,580 00
Sheet No. 2. General maintenance of yards and docks and contingent	460,000 00
Sheet No. 3. Support of Naval Asylum	59,309 00
Sheet No. 4. Repairs and preservation of navy-yards	300,000 00
Sheet No. 5. Improvements at navy-yards	75,000 00
Sheet No. 6. Civil establishment	42,806 25
Total estimates	949,695 25

I am, very respectfully, your obedient servant,

R. L. LAW,
Chief of Bureau.

Hon. R. W. THOMPSON,
Secretary of the Navy, Navy Department, Washington, D.C.

No. 1.—*Report of expenditures at navy-yards, stations, and naval asylum for the fiscal year ending June 30, 1879.*

Yards and stations.	Appropriations.					Total.
	Yard improvements.	Repairs and preservation.	General maintenance.	Civil establishment.	Contingent.	
Portsmouth, N. H.		\$24,170 13	\$39,125 04	\$3,716 06		\$67,011 23
Boston, Mass.		47,266 15	55,350 22	3,717 25		106,333 62
New London, Conn.		1,227 52	5,197 61	1,017 25		7,442 38
New York, N. Y.		35,861 82	84,522 08	5,432 29		125,816 19
League Island, Pa.	\$581 11	50,116 51	50,541 60	6,221 25	\$14,379 79	121,840 26
Washington, D. C.		30,725 50	55,741 67	3,717 25		90,184 42
Norfolk, Va.		45,966 50	58,037 64	4,644 57		108,648 71
Mare Island, Cal.		16,341 79	33,972 03	2,417 25		52,731 07
Sacket's Harbor, N. Y.	74,902 07	47,765 05	56,794 61	6,221 25		185,712 98
Key West, Fla.			916 72			916 72
Naval Asylum, Pa.		5,638 61	1,360 70			6,999 31
Wharf at Erie, Pa.	50,250 82					50,250 82
Fort Poyal, S. C.					400 00	400 00
					1,000 00	1,000 00
Totals	125,850 50	305,019 58	441,569 92	37,104 42	15,779 79	925,296 21

No. 2.—Detailed report from navy-yards and stations of expenditures under repairs and preservation during the fiscal year ending June 30, 1879.

Objects.	Portsmouth.	Boston.	New London.	New York.	League Island.	Washington.	Norfolk.	Pennacola.	Mare Island.	Key West.	Total.
Yard buildings	\$4,544 76	\$14,980 03	\$533 48	\$16,455 90	\$7,229 76	\$10,864 81	\$23,897 45	\$3,178 68	\$12,320 63	\$2,554 31	\$95,609 81
Officers' quarters	3,269 19	12,535 11	245 97	1,498 86	513 80	13,204 79	1,769 34	4,241 53	9,063 37	.....	46,382 16
Wharves, bridges, landings, and boats	3,643 44	300 23	104 86	121 89	2,226 74	1,437 54	4,342 28	1,181 90	4,947 52	2,634 95	20,941 36
Roads, walks, gutters, and drains	1,753 04	2,754 37	47 96	10,896 35	24,023 89	1,925 24	3,665 35	926 63	3,627 12	205 19	48,825 14
Fences and walls	496 05	629 67	67 66	755 09	81 17	248 86	1,737 19	652 21	2,250 98	.....	6,918 84
Crane, masts, and derricks	.....	84 00	.....	466 51	1,281 69	19 75	289 70	274 46	2,064 46	.....	4,460 57
Furnaces, forges, heating apparatus, &c.	4,027 57	1,737 43	41 89	492 07	2,895 25	456 05	1,702 92	569 07	704 33	.....	12,626 58
Tracks and scales	.....	273 33	.....	114 17	163 29	711 79	241 68	403 34	251 00	.....	2,158 60
Water and gas works	399 51	9,272 53	125 54	947 85	329 65	1,150 93	1,239 29	523 80	9,782 37	97 85	23,869 42
Dredging and scowling	.....	44 00	.....	1,467 11	4,036 95	705 74	3,924 94	.....	16 00	.....	10,194 74
Dry-docks	5,658 67	271 91	.....	33 14	968 80	.....	192 17	29 00	1,006 70	.....	8,161 29
Miscellaneous repairs	377 90	4,363 54	10 16	2,612 78	6,365 52	.....	3,964 29	4,359 96	1,630 57	140 31	23,871 03
Totals	24,170 13	47,266 15	1,227 52	35,861 82	50,116 51	30,725 50	45,866 50	16,341 79	47,705 05	5,638 61	305,019 58

No. 3. Detailed report of expenditures under general maintenance, received from navy-yards and stations during the fiscal year ending June 30, 1870.

Objects.	Porta- month.	Boston.	New Lon- don.	New York.	League Island.	Washing- ton.	Norfolk.	Pennacola.	Mare Island.	Key West.	Sacket's Harbor.	Total.
Freight and transportation.....		\$38 00	\$68 50	\$690 60	\$38 00	\$21 04	\$2 43		\$7,841 26	\$2 15		\$8,699 97
Printing, stationery, and advertising.....	\$400 04	395 50		1,022 04	444 39	441 35	377 78	\$374 49	898 90	58 20		4,381 59
Books, maps, models and drawings.....		12 00			662 83	34 90	799 75		40 00			1,549 48
Purchase and repair of fire-engines.....	34 39			313 95	2,642 81	25 62	764 61	7 45	1,960 85			4,879 78
Machinery of every description and patent- rights.....				127 85	389 09	2,441 81	570 20	40 60	1,787 01			5,629 95
Repairs on steam-engines and attendance on same.....		273 39										
Purchase and maintenance of oxen and horses, pay of hired teams, &c.....		1,059 30		4,317 86	539 59	116 83	1,314 15	2,068 29	1,823 05			11,239 07
Carts, timber, wheels, and tools of every de- scription.....	5,343 63	2,806 35	161 94	12,700 14	11,506 35	3,842 78	10,387 96	3,821 03	6,435 83			57,006 11
Postage on letters on public service and tele- grams.....	3,435 13	1,755 01		2,971 45	2,904 95	2,519 52	10,074 87	4,705 06	2,063 08			30,839 07
Furniture for government houses and offices in navy-yards.....	54 74	92 04	7 50	362 52	503 63	19 81	37 14	466 50	20 13			1,564 61
Coal and other fuel for yard and dock purposes.....	3,007 20	2,267 87	121 92	1,999 34	701 47	2,250 51	2,827 34	1,726 46	1,969 80	83 60		17,855 51
Candles, oil, and gas.....	3,785 31	3,304 24	36 37	57 59	2,438 39	1,171 73	786 33	3,605 00	3,901 09			19,086 05
Clearing and cleaning up yard and care of buildings.....	2,149 50	2,070 40		3,854 95	211 12	1,036 10	2,960 52	535 63	5,732 61			18,556 49
Attendance on fires, lights, fire-engines, and apparatus.....	4,342 74	10,227 31	1,232 36	15,950 45	4,063 49	23,503 19	7,505 04	7,000 33	7,798 44	30 50		81,713 85
Incidental labor, not chargeable to other appro- priations.....	3,087 39	3,363 05	5 20	6,985 25	7,940 80	3,177 41	3,914 46	535 92	1,639 50			30,648 98
Water tax.....	6,362 53	1,224 07	1,327 12	6,548 82	5,362 07	2,368 83	2,263 51	967 75	1,244 25		\$916 72	29,845 67
Tolls and ferrisage.....	100 00	4,533 97	51 70	4,307 18			18 00	235 20	5,175 32			14,421 37
Pay of watchmen.....	7 75	5,668 50	2,190 00	159 25			260 38		591 18			8,877 06
Flags, awnings and packing-boxes.....	6,570 00	16,162 20		22,135 50	9,802 00	11,680 00	13,039 52	7,750 00	6,665 75	1,186 25		95,021 22
Rent of landings.....	128 79	95 36		8 25	302 62	69 34	133 65	72 32	158 36			968 69
	75 00											75 00
Totals.....	39,125 04	55,350 22	5,197 61	84,522 08	50,541 00	53,741 67	58,037 64	33,973 03	56,794 61	1,360 70	916 72	441,559 92

No. 4.—*Estimates received from navy-yards, stations, and naval asylum for fiscal year ending June 30, 1881.*

Yards and stations.	Appropriations.				Total.
	Yard improve-ments.	Repairs and preservation.	General mainte-nance.	Civil establish-ment.	
Portsmouth, N. H.	\$99,515 97	\$72,600 00	\$53,185 00	\$7,556 25	\$232,807 22
Boston, Mass.	1,256,032 30	317,000 00	141,750 00	7,373 50	1,722,155 80
New London, Conn.	296,601 00	1,735 00	7,110 00	2,034 50	307,480 50
New York, N. Y.	1,308,220 45	115,000 00	103,600 00	8,400 00	1,535,220 45
League Island, Pa.	1,693,689 53	50,000 00	80,000 00	9,400 00	1,833,089 53
Washington, D. C.	12,604 70	144,090 00	74,110 00	5,917 25	234,721 95
Norfolk, Va.	622,080 68	88,706 10	69,387 40	3,956 25	784,130 43
Pensacola, Fla.	66,620 82	34,840 80	43,374 33	3,417 25	148,253 20
Mare Island, Cal.	672,741 41	106,000 00	70,000 00	6,900 00	855,641 41
Sacket's Harbor, N. Y.	20,000 00	2,000 00			2,000 00
Key West, Fla.	20,000 00	14,900 00	2,125 00		37,025 00
Naval Asylum, Pa.	79,465 00				79,465 00
Total.....	6,127,571 86	946,871 90	644,591 78	54,955 00	7,773,990 49

No. 5.—*Detailed estimates from yards and stations for works of improvement for the fiscal year ending June 30, 1881.*

Yards, stations, and objects.	Estimates.	Totals.
PORTSMOUTH, N. H.		
For yards and docks workshop.....	\$33,200 00	
For stables.....	20,927 50	
For foundry for steam-engineering.....	17,462 22	
For smithery for steam-engineering.....	7,926 25	
For water-works.....	20,000 00	
		\$99,515 97
BOSTON, MASS.		
For yards and docks workshop.....	61,432 66	
For gas-works.....	9,126 84	
For yards and docks, blacksmiths' shop.....	9,957 70	
For wet-basin.....	1,131,372 00	
For paving and grading.....	28,408 80	
For cart-shed.....	15,734 30	
		1,256,032 30
NEW LONDON, CONN.		
For quay wall.....	247,000 00	
For grading.....	40,000 00	
For foundations for yards and docks storehouse.....	9,601 00	
		296,601 00
NEW YORK, N. Y.		
For commencing new dry-dock.....	1,000,000 00	
For shipwrights' shed and oakum store.....	23,960 07	
For timber shed.....	61,120 54	
For timber and knee-basin.....	100,321 47	
For yard wall, Flushing and Washington avenues.....	90,000 00	
For coal-depot.....	32,818 37	
		1,308,220 45
LEAGUE ISLAND, PA.		
For construction of quay wall on Delaware front.....	392,000 00	
For construction of quay wall for deep basin.....	228,000 00	
For storehouse for equipment and recruiting.....	208,000 00	
For storehouse for construction and repair.....	197,000 00	
For foundry for steam-engineering.....	128,582 50	
For temporary foundry for steam-engineering.....	17,850 62	
For office building for commandant.....	53,735 79	
For dredging and filling in.....	310,000 00	
For grading, gravelling, &c.....	25,319 00	
For water-works.....	73,201 62	
For improvement of dykes.....	60,000 00	
		1,693,689 53
WASHINGTON, D. C.		
For purchase of square No. 853.....	12,604 70	
		12,604 70

No. 5.—Detailed estimates from yards and stations, &c.—Continued.

Yards, stations, and objects.	Estimates.	Totals.
NORFOLK, VA.		
For timber-shed, No. 32	\$40,925 26	
For timber-shed, No. 33	40,925 26	
For coal-house, No. 54	52,861 71	
For railroad and engine-house	32,252 77	
For extension of quay wall	319,775 00	
For two cisterns	9,485 00	
For wet-dock at Saint Helena	40,501 00	
For boiler-shop, No. 41	42,227 20	
For chain and cordage store, No. 63	20,765 98	
For coal, engine, and boiler house, No. 8	7,610 02	
For moulding-sand house, No. 25	5,224 98	
For officers' quarters, I and J	9,526 50	
		\$622,080 68
PENSACOLA, FLA.		
For timber-shed, No. 11	28,590 03	
For spar-shed and coopers' shop, No. 38	38,030 79	
		66,620 82
MARE ISLAND, CAL.		
For continuation of stone dry-dock	600,000 00	
For roads and pavements (stone)	23,799 00	
For renewing plank-road	4,206 00	
For extension of timber-shed, No. 94	19,738 41	
For ferry-boat	25,000 00	
		672,741 41
KEY WEST, FLA.		
For sea-wall and filling in front of storehouse	7,000 00	
For commencing permanent bulkhead of concrete	5,000 00	
For erection of double house for officers' quarters	8,000 00	
		20,000 00
NAVAL ASYLUM, PA.		
For support of beneficiaries, improvements, and all expenses	79,465 00	
		79,465 00
		6,127,571 86

No. 6.—Detailed estimates from navy-yards and stations for repairs and preservation for the fiscal year ending June 30, 1881.

Objects.	Portsmouth.	Boston.	New London.	New York.	League Island.	Washington.	Norfolk.	Pensacola.	Mare Island.	Sacket's Harbor.	Key West.	Total.
Yard buildings.....	\$40,000 00	\$125,000 00	\$290 00	\$20,000 00	\$3,258 00	\$47,000 00	\$39,425 04	\$17,524 05	\$14,000 00	\$2,000 00	\$5,350 00	\$303,757 09
Officers' quarters.....	5,000 00	10,000 00	355 00	5,000 00	764 00	2,000 00	1,024 79	3,043 20	10,000 00	.....	.....	38,090 99
Wharves, bridges, landings, and boats.....	5,000 00	35,000 00	550 00	30,000 00	2,250 00	33,029 00	17,791 52	7,099 80	6,000 00	.....	2,100 00	138,790 32
Roads, walks, gutters, and drains.....	2,000 00	22,500 00	225 00	10,000 00	640 00	3,540 00	15,526 20	4,010 67	5,000 00	.....	.....	63,801 97
Fences and walls.....	500 00	5,000 00	145 00	2,500 00	.....	21,711 00	1,266 61	.....	2,000 00	.....	150 00	33,572 61
Cranes, masts, and derricks.....	5,000 00	3,000 00	.....	2,500 00	1,480 00	7,800 00	2,183 28	167 70	2,000 00	.....	150 00	24,290 98
Furnaces, forges, heating apparatus, &c.....	4,000 00	1,500 00	105 00	3,000 00	1,000 00	12,250 00	291 50	.....	1,000 00	.....	800 00	23,840 50
Trucks and scales.....	100 00	10,000 00	.....	3,000 00	5,116 00	800 00	2,832 81	670 50	1,000 00	.....	.....	25,619 21
Water and gas works.....	2,000 00	10,000 00	55 00	2,500 00	2,540 00	1,000 00	3,732 30	2,055 60	5,000 00	.....	5,350 00	33,732 90
Dredging and scowling.....	.....	10,000 00	.....	25,000 00	12,153 00	10,000 00	6,219 77	.....	5,000 00	.....	.....	68,372 77
Drydock.....	7,000 00	75,000 00	.....	5,000 00	.....	.....	4,566 80	.....	45,000 00	.....	.....	136,566 80
Miscellaneous repairs.....	2,000 00	10,000 00	100 00	5,000 00	20,799 00	5,000 00	2,541 38	299 28	10,000 00	.....	500 00	56,239 66
Total.....	72,800 00	317,000 00	1,735 00	115,000 00	50,000 00	144,090 00	88,706 10	34,840 80	106,000 00	2,000 00	14,900 00	948,871 90

No. 7.—Detailed estimates for general maintenance, received from yards and stations, for the fiscal year ending June 30, 1881.

Objects.	Portsmouth.	Boston.	New London.	New York.	League Island.	Washington.	Norfolk.	Pensacola.	Mare Island.	Key West.	Total.
Freight and transportation.....	\$100 00	\$500 00		\$1,000 00	\$100 00	\$50 00	\$100 00	\$500 00	\$50 00		\$11,350 00
Printing, stationery, and advertising.....	500 00	500 00	\$225 00	1,000 00	1,000 00	1,200 00	500 00	500 00	1,000 00		6,485 00
Books, maps, models, and drawings.....	250 00	500 00		500 00	500 00	50 00	1,104 45	100 00	1,100 00	\$60 00	3,104 45
Purchases and repair of machinery.....	1,000 00	5,000 00		3,000 00	800 00	4,000 00	2,332 02	4,213 75	1,500 00		21,845 77
Machinery of every description and patent rights.....	2,000 00	1,500 00		2,500 00	5,000 00	1,500 00	1,083 75	310 00	2,000 00	100 00	15,968 75
Repairs on steam engines and attendance on same.....	1,500 00	5,000 00		5,000 00	2,000 00	5,000 00	3,863 84	3,730 50	2,000 00		28,094 34
Purchases and maintenance of stores and houses, pay of hired teams, &c.....	7,000 00	25,000 00	215 00	15,000 00	15,000 00	4,500 00	11,263 04	4,772 30	5,520 00		88,590 34
Cuts, timber, shovels, and tools of every description.....	3,500 00	20,000 00	150 00	5,000 00	5,000 00	2,000 00	9,306 31	2,760 00	2,000 00		49,808 31
Postage on letters on public service and telegrams.....	100 00	250 00	15 00	250 00	500 00	50 00	100 00	333 75	20 00		1,618 75
Furniture for government houses and offices in navy yards.....	5,000 00	4,000 00	255 00	2,500 00	1,000 00	5,000 00	5,826 25	600 00	3,000 00	100 00	27,281 25
Coal and other fuel for yards and docks purposes.....	4,000 00	4,500 00	100 00	2,500 00	2,500 00	2,500 00	760 00	500 00	5,000 00		22,860 00
Candles, oil, and gas.....	3,000 00	7,000 00		4,000 00	5,000 00	2,000 00	3,030 00	930 00	5,000 00		22,400 00
Cleaning and painting of yards and care of buildings.....	5,000 00	30,000 00	1,500 00	12,500 00	9,500 00	20,000 00	8,044 76	9,688 02	9,000 00	40 00	105,628 68
Attendance on fires, lights, fire-engines and apparatus.....	4,000 00	3,500 00		2,000 00	9,000 00	6,000 00	4,063 70	534 18	2,000 00	375 00	38,289 88
Incidental labor not chargeable to other appropriations.....	7,000 00	5,000 00	2,000 00	12,000 00	16,000 00	8,000 00	3,136 60	4,238 83	6,000 00	200 00	63,368 53
Water tax.....	100 00	10,000 00	75 00	3,000 00			30 00	201 60	5,000 00		20,406 60
Tolls and ferridges.....	50 00			200 00			300 00		300 00		825 00
Pay of watchmen.....	8,760 00	21,000 00	2,500 00	22,500 00	11,500 00	12,010 00	13,282 20	9,768 00	10,000 00	1,250 00	112,580 20
Flags, awnings, and packing-boxes.....	200 00	500 00		150 00	100 00	250 00	268 48	191 40	250 00		1,909 88
Rent of landing.....	75 00										75 00
Total.....	53,135 00	141,750 00	7,110 00	103,660 00	80,000 00	74,110 00	69,387 40	43,374 33	70,000 00	2,125 00	644,591 73

SCHEDULE OF BIDS RECEIVED DURING THE FISCAL YEAR ENDING JUNE 30, 1879.

Schedule of bids received for furnishing materials for Portsmouth navy-yard, under advertisement of July 9, 1878.

Gas oil. Class No. 15:		Corn meal. Class No. 21:	
Rider & Cotton.....	* \$169 00	Charles Robinson & Son ..	* \$126 50
George T. Vaughn.....	185 00	Lewis & Brooks.....	142 60
Hardware, oil. Class No. 17:		Upholstery:	
A. P. Wendell.....	* 105 41	C. Dwight Hanscom.....	* 56 52
Rider & Cotton.....	107 94	E. M. Brown & Co.....	79 79
G. T. Vaughn.....	111 80	Stationery. Class No. 18:	
Isaiah Wilson.....	120 23	Willis G. Myers.....	* 27 20
Charcoal. Class No. 22:		H. B. Buzzell & Son.....	28 24
Charles G. Brown.....	* 42 00	Mercer Goodrich.....	27 99
William H. Woodward....	48 00	Hardware, oil:	
John F. Plaisted.....	45 00	Rider & Cotton.....	* 280 96
Hay. Class No. 20:		A. P. Wendell & Co.....	296 79
E. C. Spinney.....	* 358 00	Isaiah Wilson.....	316 26
B. F. Cate.....	403 20	Lime and lumber:	
		Sannuel Adams & Co.....	* 539 50
		G. A. Hammond.....	826 05

Schedule of bids received for furnishing coal for Portsmouth navy-yard, on requisition No. 33, opened September 5, 1878.

W. A. anthracite, steamboat size:		W. A. anthracite, stove size—Continued.	
C. E. Walker & Co.....	* \$1,395 00	E. F. Sise & Co.....	\$801 00
L. G. Burnham & Co....	1,455 00	Cannel coal:	
E. F. Sise & Co.....	1,497 00	C. E. Walker & Co.....	* 170 00
W. A. anthracite, stove size:		L. G. Burnham & Co....	165 00
C. E. Walker & Co.....	* 750 00	E. F. Sise & Co.....	180 00
L. G. Burnham & Co....	799 50		

Schedule of bids received for material for navy-yard, Boston, under advertisement dated August 12, 1878.

Requisition No. 14. Lime and zinc:		Requisition No. 17. Cane, &c.:	
G. D. Putnam & Co.....	\$118 50	Wakefield, Rattan Co.....	\$7 60
John Mullett.....	†90 00	Requisition No. 18. Hay, straw, oats, &c.:	
Requisition No. 15. White-pine board:		John Mullett.....	†1,970 50
G. D. Putnam & Co.....	536 00	Requisition No. 19. Sperm oil, &c.:	
Skillings & Whitney Bros..	†448 00	G. D. Putnam.....	†44 32
Requisition No. 16. Varnish, &c.:		John Mullett.....	49 63
G. D. Putnam & Co.....	†309 50		

* Awarded.

† Accepted.

Schedule of bids received for materials for Boston navy-yard, under advertisement of May 16, 1879.

Roofing-slate. Class No. 1:		Two turn-tables. Class No. 5:	
Geo. D. Putnam & Co.,		Sellers & Co	*\$1,040 00
\$7.50 per square	*\$75 00	Sand and gravel. Class No. 6:	
Nails and spikes. Class No. 2:		John Mullett	625 00
Geo. D. Putnam & Co.	199 10	P. O. Riorden	*490 00
E. P. Cutter & Co.	*195 80	Lumber. Class No. 7:	
Sheet-lead. Class No. 3:		Stelson & Pope	5,704 30
Geo. D. Putnam & Co.	*88 92	Stelson & Pope	5,593 67
Chadwick Lead Works	89 10	Geo. D. Putnam & Co.	7,324 25
E. P. Cutter & Co.	99 00	Wm. Haskins & Son	Informal.
Cement. Class No. 4:		S. W. & Barnes Lumber	
I. S. Hobbs	678 00	Co	*4,373 82
G. D. Putnam & Co.	684 00	Tin pipe. Class No. 8:	
E. P. Cutter & Co.	*660 00	Taunton Iron Works	*45 00
John Mullett	675 00	E. P. Cutter & Co.	47 25
P. O. Riorden	690 00		
D. Babcock & Co.	714 00		

Schedule of bids received for coal, hay, &c., for New York navy-yard, under advertisement of March 8, 1879.

Anthracite coal, per ton:		Bituminous coal—Continued:	
A. F. Nathan	\$2 60	Jas. D. Leary	\$4 07
Jas. D. Leary	*2 48	J. H. Walker	4 47½
J. H. Walker	2 74	D. Babcock & Co.	3 94
D. Babcock & Co.	2 59	W. R. French	3 97
J. D. K. Crook	2 57	Greenlees & Quintard	4 50
W. R. French	3 76	Caldwell, Weston & Co.	4 55
Greenlees & Quintard	2 95	Hay, straw, oats, &c.:	
Caldwell, Weston & Co.	2 65	Quinn, Bros	385 87
Bituminous coal:		E. R. Shipman	*363 43
A. F. Nathans	*3 80		

Schedule of bids for paving-blocks, paving sand and lime for New York navy-yard, under advertisement of March 8, 1879.

Paving-blocks, per M.:		Paving-sand—Continued.	
Charles Guidet	\$22 85	J. M. Shannon	*\$0 49
J. M. Shannon	*17 50	D. Babcock & Co.	60
D. Babcock & Co.	17 95	Lime, per barrel:	
Paving-sand, per yard:		Charles Guidet	*95
L. Packard	73	J. M. Shannon	1 25
Charles Guidet	1 15	D. Babcock & Co.	95

Schedule of bids for furnishing gas-pipes, &c., for New York navy-yard, under advertisement of April 28, 1879.

McNeals & Archer	*\$278 36	D. Babcock & Co	\$385 00
J. H. Walker	296 76	Geo. H. Creed	391 50

*Awarded.

Schedule of bids received for materials for League Island navy-yard, under advertisement dated July 27, 1878.

Class No 1. Hose, per foot:

Eureka Fire Hose Co	\$1 00
Walton Bros.....	95
R. Levick, Son & Co	*86½

Class No. 5. Oak piles:

Francis Wessels	1, 117 20
Bartlett, G., & Co.....	1, 368 00
J. W. Gaskill & Son.....	1, 037 40
J. & C. Stockham	*864 00

Class No. 6. Piles:

Francis Wessels	†3, 689 09
Bartlett, G., & Co.....	4, 843 60

Class No. 6—Continued.

J. W. Gaskill & Son.....	*\$4, 100 86
J. & C. Stockham	5, 125 00

Class No. 11. Round iron, per pound:

Paul J. Field	2½
J. F. Gaskill	2½

Class No. 17. Nuts and washers:

Paul J. Field.....	*57 00
J. F. Gaskill.....	57 40

Schedule of bids received for materials for League Island navy-yard, under advertisement dated 23d August, 1878.

Class No. 1. W. P. boards:

Weasels, McLane & Co... *	\$590 30
W. M. Shakespeare.....	957 00
J. W. Gaskill & Son.....	621 25
A. Lewis & Co.....	770 00
E. P. Burton.....	725 00
R. S. McKay.....	906 00
No name.....	805 00

Class No. 2. Hemlock plank and scantling:

Weasels, McLane & Co... *	1, 484 75
W. M. Shakespeare.....	1, 738 00
J. W. Gaskill & Son.....	*1, 421 50
A. Lewis & Co.....	2, 040 00

Class No. 2.—Continued.

E. P. Burton.....	\$1, 815 00
E. S. McKay.....	2, 342 00
No name.....	1, 907 50

Class No. 3. Lehigh egg and stove coal, per ton:

Egg coal:

W. P. Street	4 80
Geo. B. Newton.....	*4 65
Campbell, Tucker & Co...	4 67

Stove coal:

W. P. Street.....	4 90
Geo. B. Newton.....	*4 90
Campbell, Tucker & Co...	4 92

Scale of offers for supplies for the Naval Asylum at Philadelphia, Pa., under advertisement dated August 15, 1878.

Class No. 1. Clothing:

Wanamaker & Hillman... *	\$5, 950 50
Jacob Reed's Sons.....	*5, 831 00

Class No. 2. Boots and shoes:

Wanamaker & Hillman... *	1, 860 00
Smith & Buckley.....	*1, 825 00
J. Cotter & Sons.....	1, 827 50

Class No. 3. Provisions:

Gotlieb Scheidt	10, 358 00
Joseph Comey & Sons....	9, 250 00
Thomas Bradley.....	*8, 456 50
Frederick Kritzer.....	9, 456 00
Dan'l Snyder.....	8, 703 00
Dan'l R. Hall.....	11, 547 00

Class No. 4. Groceries:

Robert McKeown	*6, 713 55
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Class No. 5. Dry-goods:

Wanamaker & Hillman... *	874 79
J. B. Shannon & Sons.....	*806 53

Class No. 6. Bread:

M. Quinn.....	*\$1, 520 00
Gustav Menzel	1, 665 00

Class No. 7. Tobacco:

J. B. Shannon & Sons.....	1, 242 00
J. Rinaldo, Sank & Co... *	1, 215 00
Paul J. Field	1, 262 25

Class No. 8. Coal and wood:

W. P. Street	*1, 882 50
W. F. Moody	1, 891 50

Class No. 9. Paints, oils, and glass:

J. B. Shannon & Sons.....	457 55
United States White Lead Company.....	*454 00
Bellah, Quigley & Co.....	505 66

Class No. 11. Lumber:

Wessels, McLean & Co... *	605 87
J. W. Gaskill & Sons	*559 00

*Accepted.

†Informal.

Class No. 13. Provender:		Class No. 15. Hardware:	
J. B. Shannon & Sons.....	\$173 00	J. B. Shannon	\$92 95
Paul J. Field	*168 30	Paul J. Field	*90 81
Class No. 14. Miscellaneous:			
J. B. Shannon & Sons.....	*373 25		
Paul J. Field	387 80		

Schedule of offers for supplies for the Naval Asylum at Philadelphia, Pa., under advertisement dated 26th May, 1879.

Class No. 1. Clothing:		Class No. 8.—Continued.	
Jacob Reed's Sons	\$5,739 50	T. B. Phillips.....	\$1,698 00
Wanamaker & Brown...	*5,030 00	F. Krosigk & Co	†1,267 75
Class No. 2. Boots and shoes:		Wm. F. Moody & Son	1,681 00
John Wanamaker	*1,602 50	N. H. Jarman	*1,464 75
Smith & Buckley	1,632 50	W. P. Streets.....	†1,832 50
William McKnight.....	†1,712 50	Class No. 9. Paints, oils, and glass:	
Class No. 3. Provisions, &c.:		D. & J. Noblet	234 60
Daniel Snyder	8,176 50	Wm. R. Elliott	*227 14
Thomas Bradley	8,280 50	J. B. Shannon & Sons	223 45
J. Corney & Son	*7,993 00	Class No. 11. Lumber:	
John T. Strickland	11,953 00	Elias Pohl.....	486 70
Class No. 4. Groceries:		S. G. Morton Maul.....	546 50
Robert McKeown	6,774 30	J. W. Gaskill & Sons	*484 60
Anderson & Dunlap	*6,447 75	Wm. R. Elliott	514 06
Class No. 5. Dry-goods:		Class No. 13. Provender:	
John Wanamaker.....	1,531 63	Paul J. Field.....	*174 75
D. & J. Noblet.....	1,090 50	Class No. 14. Miscellaneous:	
William R. Elliott.....	*1,037 52	D. & J. Noblet	875 38
J. B. Shannon & Sons ..	1,510 76	Wm. R. Elliott	*787 29
Class No. 6. Bread:		Paul J. Field	919 45
Gustav Menzel.....	*1,516 00	J. B. Shannon & Sons	860 19
M. Quinn.....	1,774 00	Class No. 15. Hardware:	
Class No. 7. Tobacco:		D. & J. Noblet	269 56
J. Rinaldo Sank & Co	*1,053 00	Wm. R. Elliott.....	226 76
Paul J. Field	1,134 00	H. C. Elder	224 83
Class No. 8. Coal and wood:		Paul J. Field	*208 19
H. C. Cook	1,630 00	J. B. Shannon & Sons	219 82

Schedule of bids received for materials for Washington navy-yard, under advertisement dated August 6, 1878.

Hay, per ton:		Oats, per bushel:	
O. E. Hine	\$17 92	O. E. Hine.....	\$0 45
R. C. Hewitt	\$17 00	R. C. Hewitt	‡32
J. A. Baker	17 90	J. A. Baker	38
Straw:		Requisition No. 109. Bunting:	
O. E. Hine	13 44	W. B. Moses.....	*91 30
R. C. Hewitt.....	\$15 00	Requisition No. 110. Locks, &c.:	
J. A. Baker	14 50	W. H. Slater & Co.....	505 45
Corn-meal, per 100 pounds:		Campbell & Co.....	519 80
O. E. Hine	1 45	L. H. Schneider & Co.....	*425 90
R. C. Hewitt	\$1 30	R. Leitch & Sons.....	427 42
J. A. Baker	1 40	W. B. Moses.....	471 70
		R. Boyd	449 36

Accepted.

† Informal.

‡ Received too late.

§ Lowest in the aggregate.

Requisition No. 111. Glass, &c.:

W. H. Slater & Co.....	\$244 20
Z. D. Gilman.....	185 60
R. Leitch & Sons.....	199 00
F. Miller.....	198 50
W. B. Moses.....	224 10
D. Shanahan.....	*167 00

Requisition No. 113. E. leather, &c.:

W. B. Moses.....	*\$73 30
Shorta, per bushel:	
O. E. Hine.....	125
R. C. Hewitt.....	20
J. A. Baker.....	19

Schedule of bids received for materials for Washington navy-yard, under advertisement dated June 30, 1879.

Requisition No. 107. Coal:

T. B. Cross, jr.....	\$771 00
C. T. Wood & Co.....	795 00
L. W. Guinand.....	*756 00
Johnson Bros.....	756 00
H. C. Jones.....	772 50

Requisition No. 108. Powder:

W. H. Slater & Co.....	\$102 05
Z. D. Gilman.....	*83 45
F. Miller.....	102 96
W. R. Stone.....	105 41
W. B. Moses.....	97 60

Schedule of bids received for furnishing lime and lumber for Norfolk navy-yard, Virginia, under advertisement of April 15, 1878.

Lime. Class No. 7:

A. A. McCullough.....	*\$99 00
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Lumber. Class No. 6:

R. J. & W. Neely & Co.....	*\$774 00
G. Armstrong & Son.....	941 50

Schedule of bids received for furnishing materials for Pensacola navy-yard, approved August 9, 1878.

Astral oil, tallow, soap, &c.:

McKensie, Oerting & Co..	*\$341 00
J. O'Neal.....	378 80
Hugh McHatton.....	328 40

Logs, ceiling, cypress:

B. A. Filibert.....	\$3440 00
J. O'Neal.....	904 00
William E. Anderson.....	*847 00
Hugh McHatton.....	930 00

Schedule of bids received for furnishing materials for Pensacola navy-yard, approved August 10, 1878.

White lead, oils, &c. Class No. 15:

J. O'Neal.....	*\$345 00
McKensie, Oerting & Co..	347 50
H. McHatton.....	\$319 50

Leather, soap, flax-seed:

J. O'Neal.....	*\$74 45
McKensie, Oerting & Co..	84 75

Schedule of bids received for furnishing materials for Pensacola navy-yard, approved December 4, 1878.

Manila rope, locks, &c.:

McKensie, Oerting & Co....	\$104 85
Hugh McHatton.....	101 75
J. O'Neal.....	110 12
John Mooney.....	*98 75

White lead, cement, zinc, &c.:

McKensie, Oerting & Co....	\$225 60
Hugh McHatton.....	322 00
J. O'Neal.....	287 75
John Mooney.....	*200 68

*Accepted.

†Lowest in the aggregate.

; Informal.

Schedule of bids received for furnishing provender for Pensacola navy-yard, approved January 17, 1879.

Corn. Class No. 21:		Oats. Class No. 21:	
J. O'Neal.....	*\$64 86	J. O'Neal.....	*\$63 36
H. McHatton.....	64 86	H. McHatton.....	69 12
John Moony.....	68 63	John Moony.....	83 52

Schedule of bids received for furnishing materials for Pensacola navy-yard, under advertisements of April 5, 1879.

Oil and provender:		Articles for general use:	
H. McHatton.....	\$712 61	H. McHatton.....	\$86 25
McKensie, Oerting & Co....	665 87	McKensie, Oerting & Co....	102 25
J. O'Neal.....	650 44	J. O'Neal.....	*76 05
J. S. Gonzales.....	\$743 00		
John Moony.....	*651 70		

Lumber. Class No. 6, lumber:	
H. Mc Hatton.....	\$180 50
J. O'Neal.....	*147 75
J. S. Gonzales.....	202 50

Schedule of bids for furnishing gasoline at the Mare Island navy-yard, Cal., November 11, 1878.

Gasoline:	
M. Ehrman & Co. at 37½ per gal.	\$3,750 00

Schedule of bids for furnishing coal to the Mare Island navy-yard, under Requisition No. 59, opened April 10, 1879.

Sidney coal:		Sidney coal—Continued:	
Aden Bros.....	\$1,100 00	A. Powell.....	\$948 50
Wm. Walker.....	980 00	Jas. McCudden.....	923 00
F. B. Taylor & Co.....	949 00	Nicholas Richard.....	895 00

Schedule of bids for furnishing broken stone, gravel, and cement for Mare Island navy-yard, Cal., opened 22d May, 1879.

Broken stone:		Gravel—Continued:	
John Evans.....	\$10,400 00	Jas. McCudden.....	\$2,345 00
E. Hawes.....	8,788 00	Aden Brothers.....	*1,995 00
Wm. Walker.....	8,060 00	Class No. 8. Cement:	
John McManus.....	7,124 00	A. Powell (in barrels).....	11,070 00
A. Powell.....	6,968 00	A. Powell (in bags).....	12,000 70
Jas. McCudden.....	*6,734 00	Jas. McCudden (in barrels).....	10,865 00
Gravel:		Jas. McCudden (in bags)....	12,320 50
L. Terkelson & Bro.	3,745 00	F. B. Taylor & Co (in barrels).....	*10,520 60
H. S. Martin.....	3,430 00	F. B. Taylor & Co (barrels).....	
E. Hawes.....	3,325 00	in bond.....	9,598 00
A. Powell.....	2,590 00		

* Accepted.

*Estimates of appropriations required for the service of the fiscal year ending June 30, 1881,
by the Bureau of Yards and Docks, Navy Department.*

Detailed objects of expenditure, and explanations.	Estimated amount which will be re- quired for each detailed object of expenditure.	Amount appropri- ated for the cur- rent fiscal year ending June 30, 1880.
SALARIES.		
One chief clerk, per act of June 21, 1879.....	\$1,800 00	
One draughtsman and clerk, same act.....	1,800 00	
One clerk class four, same act.....	1,800 00	
One clerk class three, same act.....	1,600 00	
One clerk class two, same act.....	1,400 00	
One clerk class one, same act.....	1,200 00	
One clerk, same act.....	1,000 00	
One messenger, same act.....	720 00	
One laborer, same act.....	660 00	
	11,980 00	\$11,980 00
Contingent expenses:		
Stationery, books, plans, drawings, incidental labor, and miscellaneous items.....	600 00	600 00
	12,580 00	12,580 00
GENERAL MAINTENANCE.		
For general maintenance of yards and docks, freights and transportation of materials and stores; books, maps, models, and drawings; purchase and repair of fire-engines; machinery and patent right to use the same; repairs of steam-engines and attendance on the same; purchase and maintenance of oxen, horses, and driving teams; carts and timber-wheels for navy-yard purposes; tools and repairs of the same; dredging; postage on letters and other mailable matter on public service, and telegrams; furniture for gov- ernment houses and offices in navy-yards; coal and other fuel; candles, oil, and gas; cleaning and clearing yards, and care of public buildings; attend- ance on fire, lights, fire-engines, and apparatus; for clerical and incidental labor at navy-yards; water-tax; tolls and ferriages; pay of watchmen in navy-yards; awnings and packing-boxes for yards and docks purposes, per act of February 14, 1879.....	440,000 00	440,000 00
Contingent:		
For contingent expenses that may arise at navy-yards and stations.....	20,000 00	20,000 00
	460,000 00	460,000 00
NAVAL ASYLUM, PHILADELPHIA, PA.		
One superintendent, per act of February 14, 1879.....	600 00	
One steward, same act.....	480 00	
One matron, same act.....	360 00	
One cook, same act.....	240 00	
Two assistant cooks, at \$168 each, same act.....	336 00	
One chief laundress, same act.....	192 00	
Four laundresses, at \$168 each, same act.....	672 00	
Eight scrubbers and waiters, at \$168 each, same act.....	1,344 00	
Six laborers, at \$240 each, same act.....	1,440 00	
One stable-keeper and driver, same act.....	360 00	
One master-at-arms, same act.....	480 00	
One corporal, same act.....	300 00	
One barber, same act.....	360 00	
One carpenter, same act.....	845 00	
	8,009 00	8,009 00
For water, rent, and gas, per act of February 14, 1879.....	2,000 00	
For ice, same act.....	200 00	
For car-rickets, same act.....	250 00	
For cemetery and burial expenses, head-stones, and digging graves, same act.....	350 00	
For improvement of grounds, same act.....	500 00	
For repairs and preservation of all kinds, painting, and for grates, furnaces, ranges, furniture, and repairs of furniture, same act.....	4,500 00	
For support of beneficiaries, same act.....	43,500 00	
	51,300 00	51,300 00
	59,309 00	59,309 00
REPAIRS AND PRESERVATION.		
For navy yards and stations, per act March 3, 1879.....	300,000 00	300,000 00

Estimates of appropriations required for the service, &c.—Continued.

Detailed objects of expenditure, and explanations.	Estimated amount which will be required for each detailed object of expenditure.	Amount appropriated for the current fiscal year ending June 30, 1880.
NAVY-YARD MARE ISLAND, CAL.		
For continuation of stone dry dock, per act March 3, 1879	\$75,000 00	\$75,000 00
CIVIL ESTABLISHMENT.		
Navy-yard, Portsmouth, N. H.:		
One clerk, per act March 3, 1879	1,400 00	
One clerk, same act	1,300 00	
One writer, same act	1,017 25	
One mail messenger, same act	700 00	
	4,417 25	3,717 25
Navy-yard, Boston, Mass.:		
One clerk, per act March 3, 1879	1,400 00	
One clerk, same act	1,300 00	
One writer, same act	1,017 25	
One mail messenger, same act	700 00	
	4,417 25	3,717 25
Naval station, New London, Conn.:		
One writer, act March 3, 1879	1,017 25	1,017 25
Navy-yard, Brooklyn, N. Y.:		
One clerk, per act March 3, 1879	1,400 00	
One clerk, same act	1,300 00	
One writer, same act	1,017 25	
One writer, same act	939 00	
One draughtsman, same act	1,565 00	
One mail messenger, same act	700 00	
	6,921 25	6,221 25
Navy-yard, League Island, Pa.:		
One clerk, per act March 3, 1879	1,400 00	
One clerk, same act	1,300 00	
One writer, same act	1,017 25	
One writer, same act	939 00	
One draughtsman, same act	1,565 00	
One mail messenger, same act	700 00	
	6,921 25	6,221 25
Navy-yard, Washington, D. C.:		
One clerk, per act March 3, 1879	1,400 00	
One clerk, same act	1,300 00	
One writer, same act	1,017 25	
One mail messenger, same act	700 00	
	4,417 25	3,717 25
Navy-yard, Norfolk, Va.:		
One clerk, per act March 3, 1879	1,400 00	
One clerk, same act	1,300 00	
One writer, same act	1,017 25	
One writer, same act	939 00	
One mail messenger, same act	700 00	
	5,356 25	4,656 25
Navy-yard, Pensacola, Fla.:		
One clerk, per act March 3, 1879	1,400 00	
One writer, same act	1,017 25	
	2,417 25	2,417 25
Navy-yard, Mare Island, Cal.:		
One clerk, per act March 3, 1879	1,400 00	
One clerk, same act	1,300 00	
One writer, same act	1,017 25	
One writer, same act	939 00	
One draughtsman, same act	1,565 00	
One mail messenger, same act	700 00	
	6,921 25	6,221 25
	42,806 25	37,906 25

No. 7.—BUREAU OF PROVISIONS AND CLOTHING.

BUREAU OF PROVISIONS AND CLOTHING,
October 30, 1879.

SIR: I have the honor to submit herewith, in accordance with your instructions of the 3d instant, estimates marked A, B, C, D, and E, for the fiscal year ending June 30, 1881, together with schedules numbered from 1 to 6, inclusive, and statement No. 7, pertaining to the operations of this bureau during the year ending June 30, 1879.

Since my last report there has been established at the inspection, navy-yard, Brooklyn, a system for finishing and cutting clothing material, and making garments of the present patterns for the naval service. A room, with the necessary machinery, has been completed, and the making of the garments is being done by worthy and needy women, so many of whom are found in the vicinity of our large cities.

The clothing is issued on board vessels at its actual cost, and when the stock on hand, of material purchased at high prices, is exhausted, clothing can be cut and made at a less rate than could be obtained by the contract system, besides being of better workmanship and more strictly in accordance with the prescribed uniform.

By the establishment of this system, which has already proved a success, but a very small stock of made-up clothing need be kept on hand, thereby saving the government great loss in deterioration and destruction of such perishable matter.

The new labor now being performed in the manufacture of clothing at the navy-yard, New York, necessitates the employment of an additional writer, for the payment of whom the amount of \$1,017.25 is included in the accompanying estimates.

Respectfully,

GEO. F. CUTTER,
Paymaster-General, U. S. N.

Hon. R. W. THOMPSON,
Secretary of the Navy.

1.—Schedule of proposals for fresh provisions, navy bread, baking, and water, received during the fiscal year ending June 30, 1879, the supplies to be delivered during the fiscal year 1879-'80.

Name.	Where to be delivered.	Fresh bread.	Fresh beef.	Vegetables.	Navy bread.	Baking.	Water.
		Per pound.	Per pound.	Per pound.	Per pound.	Per bbl. of flour.	Per 100 gallons.
C. L. Brown*	Portsmouth, N. H.	\$0 06	\$0 06½	\$0 01½			
J. E. Chase	do		06½	01½			
Snow & Higgins*	Boston, Mass.		10	01½			
J. W. Hobbs	do		11	01½			
H. P. Stevens	do		10½	02½			
C. Flanders	do		11½	02			
C. F. Austin & Co*	do	06				\$1 75	
J. Schreatwaser†	New York, N. Y.		06½	01			
J. Hanley*	do		11½	02½			
M. Dillon†	do		06½	01			
J. Nevins	do		12½	04			
E. Morrison	do		12½	04			
Konrad Mess.	do		12½	04½			
M. Bigg†	do	03					
F. Fruin	do	06½					
J. Burns	do	06½					
F. Walsht	do	03½					
P. Masont	do	02½					
J. McNamara*	do	06					
C. F. Goodwin & Sons*	do					04½	
E. Trendwell & Sons	do					95	
I. S. Ivins & Son*	League Island, Pa.					1 44	
Hartman & Bro†	do					1 39	

1.—Schedule of proposals for fresh provisions, &c.—Continued.

Name.	Where to be delivered.	Fresh bread.	Fresh beef.	Vegetables.	Navy bread.	Baking.	Water.
		Per pound.	Per pound.	Per pound.	Per pound.	Per bbl. of flour.	Per 100 gallons.
L. S. Borae*	League Island, Pa.	*0 04 ⁷ / ₈	*0 09	*0 03 ¹ / ₂			
J. Corney & Son*	do	05	*09 ¹ / ₂	*03			
M. H. Homiller*	Washington, D. C.		03 ⁷ / ₈	01 ¹ / ₂			
J. T. Varnell.	do		04 ¹ / ₂	01 ¹ / ₂			
George Seitz*	do	03 ⁷ / ₈					
J. R. Kelly	do		05 ¹ / ₂	02			
J. D. Mason & Co*	do					\$1 09	
B. Charlton	do					1 48	
Kimberly Brothers*	Norfolk, Va.	*03 ⁷ / ₈	05	01 ³ / ₈			
L. F. Winningder	do		05 ⁷ / ₈	01 ³ / ₈			
J. Gutman	do		05 ⁷ / ₈	01 ³ / ₈			
J. C. Codd & Bro	do		05 ⁷ / ₈	01 ⁷ / ₈			
William F. Dann	do		05 ⁷ / ₈	01			
N. Baum	do		05 ¹ / ₂	01			
F. Dusch	do		05 ⁷ / ₈	01			
William H. Kimberly	do		07 ¹ / ₂	02			
S. Westheimer*	do		05 ⁷ / ₈	01 ¹ / ₂			
C. R. Robertson	do		06	01 ¹ / ₂			
C. T. Cabler	do	03 ¹ / ₂					
J. D. Mason & Co	do					1 37	
J. Reid & Co*	do					1 23	
William B. Baker	do						\$0 25
William Clark*	do						14 ¹ / ₂
Do*	Fortress Monroe						20
Benjamin Burr*	Port Royal, S. C.		*14	*03			1 12 ¹ / ₂
James Odell*	do	06 ¹ / ₂					
J. C. Mayo*	do						1 20
D. K. Small	do						1 50
J. O. Neal*	Pensacola, Fla.				\$0 05		
James Murphy*	do		06 ¹ / ₂	02 ¹ / ₂			
J. S. Bell	do		07	03			
Moses White*	do	*07			06		
John Mooney	do				05 ¹ / ₂		
J. J. Philbrick*	Key West, Fla.		12 ¹ / ₂	05			
G. W. Maslin*	do				07		
M. Gradwohl & Co	Mare Island, Cal.		09 ¹ / ₂	03 ¹ / ₂			
A. Newman & Co	do		08 ¹ / ₂	03 ¹ / ₂			
J. F. Tobin*	do		07 ¹ / ₂	03 ¹ / ₂			
D. T. Brown	do	03 ¹ / ₂					
John Faust*	do	03 ¹ / ₂					

* Contract awarded.

† Informal.

; Not suitable.

2.—Schedule of proposals for clothing and clothing materials received during the fiscal year ending June 30, 1879.

Name.	5,000 yards of Barna- ley sheeting.	5,000 pairs of blue flannel drawers.	5,000 pairs of woolen socks.	3,000 working suits.	500 boys' blue flannel undershirts.	500 boys' blue flannel drawers.	10,000 yards of thin flannel.	2,000 mattresses.
	Per yd.	Per pr.	Per pr.	Each.	Each.	Per pr.	Per yd.	Each.
R. Y. Pippey*	\$0 88	\$1 55	\$0 35	*\$1 22	\$1 46	\$1 52	\$0 41 ¹ / ₂	*\$4 22
William Mathews*	84 ⁷ / ₈	1 54		1 54	*1 44	1 44	*32 ⁷ / ₈	4 04
A. H. & C. B. Alling*			*31 ¹ / ₂					
A. L. Haskell & Son		1 60	33	1 37		1 54		4 23
George H. Wyman	92 ¹ / ₂							
George H. Creed*	*68 ⁷ / ₈	1 64 ¹ / ₂		1 29 ¹ / ₂	1 64 ¹ / ₂	1 64 ¹ / ₂		
Mission Woolen Mills*		*1 48	33		1 63	*1 34		
J. W. McKnight								6 59
T. Thompson, Sons & Co								5 25
J. H. Wilcox								4 87
A. T. Stewart & Co								4 74
J. B. Howard								5 35
George P. Goff								4 69
S. L. Fagg								5 60
Hall & Stephens								4 67
M. Hardenburgh								4 74 ⁷ / ₈
H. T. Champney								4 71
Dell & J. C. Noblit								4 72

Contract awarded.

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1. *Schedule of proposals for canned stores, received during the fiscal year ending June 30, 1879.*

Name.	Date of proposals.	Where to be delivered.	Butter.		Preserved beef.		Evaporated apples.		Compressed corned beef.	
			Amount.	Per lb.	Amount.	Per lb.	Amount.	Per lb.	Amount.	Per lb.
H. K. & F. B. Thurber & Co.*	Sept. 4, 1878	New York	800 pounds, in 1-pound tins	\$0 28½						
		do	3,200 pounds, in 2-pound tins	27½						
		Boston	400 pounds, in 1-pound tins	28½						
		do	1,600 pounds, in 2-pound tins	27½						
		do	480 pounds, in 3-pound tins	31						
Simpson, McIntire & Co.*	Dec. 24, 1878	do	2,020 pounds, in 7-pound tins	30						
		New York	1,036 pounds, in 3-pound tins	31						
		do	4,944 pounds, in 7-pound tins	30						
		Norfolk	864 pounds, in 3-pound tins	31						
		do	4,136 pounds, in 7-pound tins	30						
Libby, McNeill & Libby W. K. Lewis & Bros* Burnham & Morrill J. W. Jones M. P. Smith*	Jan. 2, 1879	New York			100,000 lbs.	\$0 12½ 11½ 14 12				
		do					10,000 lbs.	\$0 16	10,000 lbs.	\$0 13½
		do								
		do								
		do								
Simpson, McIntire & Co.* J. W. Jones*	Jan. 3, 1879 Feb. 17, 1879 May 9, 1879 June 18, 1879 June 24, 1879	do	10,000 pounds, in 7-pound tins	28						
		do			100,000 lbs.	15				
		do								
		do								
		do	15,000 pounds, in 3-pound tins	30						

* Contract awarded.

5.—Schedule of proposals for tobacco, received during the fiscal year ending June 30, 1879.

Name.	Receipt of proposals.	Amount required.	Price per pound.
P. Lorillard & Co.	Sept. 10, 1878	60,000	Pounds.
P. H. Mayo & Brother			\$0 48½
Dausman & Drummond			48½
P. H. Mayo & Brother	Mar. 18, 1879	20,000	54
C. W. Spicer			48½
P. H. Mayo & Brother	June 25, 1879	60,000	38½
			40½

* Contract awarded.

6.—Schedule of proposals for seven sets of stationery, received during the fiscal year ending June 30, 1879.

Name.	Where to be delivered.	Total price.
William H. Dempsey	Washington, D. C	\$437 50
William Ballantyne & Son*	do	370 00

* Contract awarded.

7.—Statement of contracts made by the Bureau of Provisions and Clothing for and in behalf of the Navy Department, during the fiscal year ending June 30, 1879.

Name.	Date.	Articles contracted for.	Price.	Where to be delivered.
	1878.			
J. S. Bell	July 1	Fresh beef	per lb. \$0 07	Pensacola, Fla.
Do.	July 1	Vegetables	do. 03	Do.
D. T. Brown	July 6	Fresh bread	do. 04½	Mare Island, Cal.
J. F. Tobin	July 6	Fresh beef	do. 08	Do.
Do.	July 6	Vegetables	do. 03½	Do.
California Cracker Com- pany.	July 8	Navy bread	do. 03½	Do.
G. W. Maslin	July 8	Navy bread	do. 07	Key West, Fla.
J. J. Philbrick	July 29	Fresh beef	do. 11	Do.
Do.	July 29	Vegetables	do. 05	Do.
F. Foehrenbach & Co.	Aug. 24	Pickles	do. 06½	New York, N. Y.
H. K. & F. B. Thurber & Co.	Sept. 9	Butter, 800 lbs. in 1-lb. tins	do. 28½	Do.
Do.	Sept. 9	Butter, 3,200 lbs. in 2-lb. tins	do. 27½	Do.
Do.	Sept. 9	Butter, 400 lbs. in 1-lb. tins	do. 28½	Boston, Mass.
Do.	Sept. 9	Butter, 1,600 lbs. in 2-lb. tins	do. 27½	Do.
P. H. Mayo & Bro.	Sept. 18	Tobacco, 60,000 lbs	do. 48½	New York, N. Y.
William Mathews	Sept. 19	Boys' undershirts, 500	each. 1 44	Do.
A. H. & C. B. Alling	Sept. 23	Woolen socks, 500 pairs	per pair. 31½	Do.
B. Y. Pipey	Sept. 26	Working suits, 3,000	each. 1 22	Do.
Mission Woolen Mills Company.	Oct. 4	Men's flannel drawers, 5,000	per pair. 1 48	Do.
Do.	Oct. 4	Boys' flannel drawers, 500	do. 1 34	Do.
George H. Creed	Oct. 7	Barnsley sheeting, 5,000 yds. per yard	do. 68½	Do.
William Mathews	Dec. 24	Thin blue flannel, 10,000 yds.	do. 32½	Do.
Simpson, McIntire & Co.	Dec. 26	Butter, 480 lbs. in 3-lb. tins	per lb. 31	Boston, Mass.
Do.	Dec. 26	Butter, 2,020 lbs. in 7-lb. tins	do. 30	Do.
Do.	Dec. 26	Butter, 1,056 lbs. in 3-lb. tins	do. 31	New York, N. Y.
Do.	Dec. 26	Butter, 4,944 lbs. in 7-lb. tins	do. 30	Do.
Do.	Dec. 26	Butter, 864 lbs. in 3-lb. tins	do. 31	Norfolk, Va.
Do.	Dec. 26	Butter, 4,136 lbs. in 7-lb. tins	do. 30	Do.
	1879.			
F. Foehrenbach & Co.	Jan. 6	Pickles, 20,000 lbs	do. 07	Do.
M. P. Smith	Jan. 8	Evaporated apples, 10,000 lbs	do. 16	Do.
Roux & Faubel	Jan. 10	Beans, 10,000 gals	per gal. 18½	New York, N. Y.
William Mathews	Jan. 11	Beef, 500 bbls	per bbl. 13 67	Do.
Do.	Jan. 11	Pork, 500 bbls	do. 10 47	Do.
Do.	Jan. 11	Vinegar, 3,000 gals	per gal. 19½	Do.
Do.	Jan. 11	Beans, 7,000 gals	do. 21½	Norfolk, Va.
Do.	Jan. 11	Vinegar, 3,000 gals	do. 20½	Do.
Do.	Jan. 11	Sugar, 50,000 lbs	per lb. 07½	Do.

7.—Statement of contracts made by the Bureau of Provisions and Clothing, &c.—Continued.

Name.	Date.	Articles contracted for.	Price.	Where to be delivered.
H. K. & F. B. Thurber & Co.	1878. Jan. 12	Rice, 20,000 lbs.....	per lb. \$0 07 ³⁴ ₁₀₀	New York, N. Y.
Do.....	Jan. 12	Molasses, 2,000 gals.....	per gal. 33	Do.
Do.....	Jan. 12	Rice, 15,000 lbs.....	per lb. 07 ⁴⁴ ₁₀₀	Norfolk, Va.
Do.....	Jan. 12	Molasses, 3,000 gals.....	per gal. 34	Do.
R. M. Masterton.....	Jan. 13	Coffee, 60,000 lbs.....	per lb. 15 ⁴⁰ ₁₀₀	New York, N. Y.
W. K. Lewis & Bros.....	Jan. 15	Preserved beef, 100,000 lbs.....	do. 11 ⁴⁰ ₁₀₀	Do.
Libby, McNeill & Libby.....	Feb. 17	Compressed corned beef, 10,000 lbs.....	do. 13 ⁴⁰ ₁₀₀	Do.
B. Y. Pippey.....	Feb. 24	Mattresses, 2,000.....	each. 4 22	Do.
P. H. Mayo & Bro.....	Mar. 18	Tobacco, 20,000 lbs.....	per lb. 48 ⁴ ₁₀₀	Do.
Simpson, McIntire & Co.....	May 14	Butter, 10,000 lbs. in 7-lb. tins.....	do. 28	Do.
John Hanley.....	May 22	Fresh beef.....	do. 11 ⁴ ₁₀₀	Do.
Do.....	May 22	Vegetables.....	do. 02 ⁴ ₁₀₀	Do.
J. McNamara.....	May 22	Fresh bread.....	do. 06	Do.
C. T. Goodwin & Sons.....	May 23	Baking bread.....	per bbl. of flour. 94 ⁴ ₁₀₀	Do.
James Reid & Co.....	May 29	Baking bread.....	do. 1 23	Norfolk, Va.
S. Westheimer.....	May 29	Fresh beef.....	per lb. 05 ⁴⁰ ₁₀₀	Do.
Do.....	May 29	Vegetables.....	do. 01 ⁴⁰ ₁₀₀	Do.
William Clark.....	May 30	Fresh water.....	per 100 gals. 14 ⁴ ₁₀₀	Do.
Do.....	May 30	Fresh water.....	do. 20	Hampton Roads, Va.
I. S. Irvine & Son.....	June 3	Baking bread.....	per bbl. of flour. 1 44	League Island, Pa.
C. F. Austin & Co.....	June 4	Baking bread.....	do. 1 75	Boston, Mass.
Do.....	June 4	Fresh bread.....	per lb. 06	Do.
Snow & Higgins.....	June 4	Fresh beef.....	do. 10	Do.
Do.....	June 4	Vegetables.....	do. 01 ⁴ ₁₀₀	Do.
James Murphy.....	June 7	Fresh beef.....	do. 06 ⁴ ₁₀₀	Pensacola, Fla.
Do.....	June 7	Vegetables.....	do. 02 ⁴ ₁₀₀	Do.
Morre White.....	June 7	Fresh bread.....	do. 07	Do.
J. O'Neal.....	June 7	Navy bread.....	do. 05	Do.
L. S. Boraeff.....	June 9	Fresh beef.....	do. 04 ⁴ ₁₀₀	League Island, Pa.
J. Corney.....	June 9	Fresh beef.....	do. 06 ⁴ ₁₀₀	Do.
Do.....	June 9	Vegetables.....	do. 03	Do.
George Selts & Son.....	June 11	Fresh bread.....	do. 03 ⁴⁰ ₁₀₀	Washington, D. C.
J. D. Mason & Co.....	June 12	Baking bread.....	per bbl. of flour. 1 09	Do.
Kimberly Brothers.....	June 14	Fresh bread.....	per lb. 03 ⁴⁰ ₁₀₀	Norfolk, Va.
J. F. Tobin.....	June 14	Fresh beef.....	do. 07 ⁴ ₁₀₀	Mare Island, Cal.
Do.....	June 14	Vegetables.....	do. 03 ⁴ ₁₀₀	Do.
C. L. Brown.....	June 14	Fresh beef.....	do. 06 ⁴ ₁₀₀	Portsmouth, N. H.
Do.....	June 14	Vegetables.....	do. 01 ⁴ ₁₀₀	Do.
John Faust.....	June 16	Fresh bread.....	do. 08	Do.
Benjamin Burr.....	June 19	Fresh beef.....	do. 03 ⁴ ₁₀₀	Mare Island, Cal.
Do.....	June 19	Fresh beef.....	do. 14	Port Royal, S. C.
Do.....	June 19	Vegetables.....	do. 03	Do.
George W. Maslin.....	June 19	Navy bread.....	do. 07	Key West, Fla.
M. H. Homiller.....	June 19	Fresh beef.....	do. 03 ⁴⁰ ₁₀₀	Washington, D. C.
Do.....	June 19	Vegetables.....	do. 01 ⁴ ₁₀₀	Do.
James Odell.....	June 21	Fresh bread.....	do. 06 ⁴ ₁₀₀	Port Royal, S. C.
J. C. Mayo.....	June 21	Fresh water.....	per gal. 01 ⁴ ₁₀₀	Do.
J. W. Jones.....	June 25	Preserved beef, 100,000 lbs.....	per lb. 15	New York, N. Y.
C. W. Spicer.....	June 28	Tobacco, 60,000 lbs.....	do. 38 ⁴⁰ ₁₀₀	Do.
Simpson, McIntire & Co.....	June 28	Butter, 15,000 lbs. in 3-lb. tins.....	do. 30	Do.

NOTE.—Fresh beef and vegetables, bread, and water to be delivered during the fiscal year in quantities as required.

*Estimates of appropriations required for the service of the fiscal year ending June 30, 1881,
by the Bureau of Provisions and Clothing.*

Detailed objects of expenditure, and explanations.	Estimated amount which will be required for each detailed object of expenditure.	Total amount to be appropriated under each head of appropriation.	Amount appropriated for the current fiscal year ending June 30, 1880.
A.—EXPENSES OF THE BUREAU OF PROVISIONS AND CLOTHING.			
For salary of chief clerk, per act July 5, 1862 (12 Stat. at L., p. 511, sec. 3)	\$1,800 00		
For salary of one clerk of class four, per act July 23, 1866 (14 Stat. at L., p. 208, sec. 8)	1,800 00		
For salary of two clerks of class three, per act July 23, 1866 (14 Stat. at L., p. 208, sec. 8)	3,200 00		
For salary of two clerks of class two, per act July 23, 1866 (14 Stat. at L., p. 208, sec. 8)	2,800 00		
For salary of three clerks of class one, per act July 23, 1866 (14 Stat. at L., p. 208, sec. 8)	3,600 00		
For salary of messenger, per act June 21, 1879 (pamphlet edition Stat. at L., p. 23)	720 00		
For salary of one laborer, per act June 21, 1879 (pamphlet edition Stat. at L., p. 23)	660 00		
		\$14,580 00	\$14,580 00
B.—CONTINGENT EXPENSES OF THE BUREAU.			
For blank books, stationery, and miscellaneous items, per act June 21, 1879 (pamphlet edition Stat. at L., p. 23)		400 00	400 00
C.—PROVISIONS FOR THE NAVY.			
For provisions and commutation of rations for 1,200 officers, 7,500 men, and 1,000 marines; expenses of inspections and storehouses; the handling and transportation of provisions; and for water for ships, per act February 14, 1879 (pamphlet edition Stat. at L., p. 288)		1,200,000 00	1,025,000 00
For provisions and commutation of rations for 750 boys, per act May 12, 1879 (pamphlet edition Stat. at L., p. 3)		82,125 00	
D.—CONTINGENT EXPENSES OF THE NAVY UNDER THE BUREAU OF PROVISIONS AND CLOTHING.			
For freight on shipments (except provisions), candles, fuel, books and blanks, stationery, advertising, commissions on sales, foreign postage, telegrams, express charges, tolls, ferrage, car-tickets, yeomen's stores, iron safes, newspapers, ice, and other expenses not enumerated, per act February 14, 1879 (pamphlet edition Stat. at L., p. 288)		60,000 00	60,000 00
E.—CIVIL ESTABLISHMENT BUREAU OF PROVISIONS AND CLOTHING.			
Navy-yard, Boston, Mass.:			
One writer to paymaster, per act February 14, 1879 (pamphlet edition Stat. at L., p. 288)	1,017 25		
One writer to inspector, per act February 14, 1879 (pamphlet edition Stat. at L., p. 288)	1,017 25		
Navy-yard, New York, N. Y.:			
One writer to inspector, per act February 14, 1879 (pamphlet edition Stat. at L., p. 288)	1,017 25		
One writer to paymaster, per act February 14, 1879 (pamphlet edition Stat. at L., p. 288)	1,017 25		
One writer to paymaster, per act February 14, 1879 (pamphlet edition Stat. at L., p. 288)	939 00		
One writer in clothing and manufacturing room (new work), submitted	1,017 25		
Navy-yard, League Island, Pa.:			
One writer to paymaster, per act February 14, 1879 (pamphlet edition Stat. at L., p. 288)	1,017 25		
Navy-yard, Washington, D. C.:			
One writer to paymaster, per act February 14, 1879 (pamphlet edition Stat. at L., p. 288)	1,300 00		
Navy-yard, Norfolk, Va.:			
One writer to paymaster, per act February 14, 1879 (pamphlet edition Stat. at L., p. 288)	1,017 25		
One writer to inspector, per act February 14, 1879 (pamphlet edition Stat. at L., p. 288)	1,017 25		
Navy-yard, Mare Island, Cal.:			
One writer to paymaster, per act February 14, 1879 (pamphlet edition Stat. at L., p. 288)	1,017 25		
One writer to inspector, per act February 14, 1879 (pamphlet edition Stat. at L., p. 288)	1,017 25		
		12,411 50	11,394 25

No. 8.—BUREAU OF STEAM-ENGINEERING.

NAVY DEPARTMENT,
BUREAU OF STEAM-ENGINEERING,
Washington, November 10, 1879.

SIR: In obedience to your order, I have the honor to submit to the department the annual report of this bureau.

By act of Congress approved May 4, 1878, there was appropriated for Bureau of Steam-Engineering for the fiscal year ending June 30, 1879, \$800,000, which amount has been expended as follows, viz :

Labor in navy-yards and stations in constructing new engines, boilers, and their dependencies, repairing old boilers, machinery, &c., and fitting vessels for sea-service, purchase and preservation of tools, handling and preservation of materials and stores.....	\$539,730 00
Purchase of materials, stores, &c., freights, and incidental expenses (of which \$30,728.28 was for coal for shops at the navy-yards under cognizance of Bureau of Steam-Engineering for use during the fiscal year) ..	220,362 20
Payments made on foreign stations for repairs, materials, &c.....	21,100 15
Total	781,192 35
Less repayments by transfers in adjustments of appropriations.....	2,017 91
Total actual expenditures.....	779,174 44
Balance on hand	20,825 56
Total amount appropriated for 1878-79.....	800,000 00

The balance of \$20,825.56, however, is covered by obligations of the bureau for purchases, &c., at home and abroad, the vouchers for which have not yet been received.

The following amounts have been paid from the "deficiency appropriation" act, dated June 14, 1878, in addition to amounts exhibited in my last annual-report, viz :

To Fabri & Channey and others, for whom J. D. Hurlburt & Son were ship-brokers	\$3,050 58
To Pratt and Whitney Company	21,465 15
To Harlan and Hollingsworth Company.....	10,000 00
To John Roach	70,282 09
Total	104,797 82

There yet remain to be paid from the above appropriation, for work not yet completed, or accounts not yet settled, the following sums, viz :

To Harlan and Hollingsworth Company.....	\$12,681 68
To William Cramp & Sons.....	22,850 00
To John Roach	14,007 09
Total to be paid	49,738 77

The following amounts were appropriated in excess of what was found upon final settlement of accounts to be due the parties named, and can be turned into the Treasury or reappropriated, viz :

Banner & Pinckney	\$0 45
Eastern Railroad Company	11 90
Old Dominion Steamship Company.....	2 32
Philadelphia and New York Steam-Navigation Company.....	2 12
Pratt and Whitney Company.....	1,274 78
Quintard Iron Works	301 66
American Tube Works	4,820 57
Providence Steam-Engine Company.....	20,325 35
Total	26,739 15

BOILER CONTRACTS.

Since my last report, the boilers which were being constructed for the iron-clads *Amphitrite*, *Puritan*, and *Terror*, contracted for under the last administration, have been completed, inspected, and received, and they have been carefully stored at the works of the several contractors where they were built.

GENERAL OPERATIONS OF THE BUREAU.

The following will exhibit the extent and character of the work done under the cognizance of this bureau, since my last report, upon machinery and boilers of naval steamers, together with their present condition, and what is required to fully complete and fit them for sea.

Alert (3d rate).—General overhauling and repairs to engines, boilers, &c., have been completed at the navy-yard, Mare Island, Cal., and a new four-bladed screw propeller, of bureau design, has been fitted. Ship in commission.

Kearsarge (3d rate).—Extensive repairs have been made to the machinery at the navy-yard, Portsmouth, N. H. New boilers have been put on board, and a new four-bladed screw propeller, of bureau design, has been fitted. Ship in commission.

Marion (3d rate).—General overhauling and repairs have been made at the navy-yard, Portsmouth, N. H. Ship in commission.

Shenandoah (2d rate).—Thorough and extensive repairs have been made to the machinery, new boilers have been supplied, and a new four-bladed screw propeller, of bureau design, has been fitted at the navy-yard, New York. Ship in commission as flag-ship.

Svatara (3d rate).—General overhauling and repairs to boilers, engines, &c., are nearly completed at the navy-yard, Boston, Mass.

Tennessee (2d rate).—Engines, boilers, and dependencies have been thoroughly overhauled and repaired, and a new four-bladed screw propeller, of bureau design, has been fitted at the navy-yard, New York.

Wachusett (3d rate).—Extensive overhauling and repairs were made to the engines at the navy-yard, Boston, Mass. New boilers were placed on board, and a new four-bladed screw propeller, of bureau design, fitted. Ship in commission.

Michigan (3d rate).—Boilers have been thoroughly overhauled and repaired at Erie, Pa. Ship in commission.

Rose (tug).—Slight repairs have been made to boilers at the navy-yard; Pensacola, Fla.

Jeannette.—In addition to the foregoing work, the bureau made extensive repairs to the engines, &c., of this vessel, at the navy-yard, Mare Island, Cal., and supplied her with two new boilers intended for the *Mohican*. These boilers, as originally designed, were fitted with one furnace each, but, from the experience gained by practice, it was deemed advisable to change them to double-furnace boilers, which was done. Reports of her performance since sailing for the polar regions give very satisfactory accounts of her efficiency and reliability in motive power.

The bureau desires, in this connection, to bring to the notice of the department the zeal, dispatch, and economy displayed and carried out by Chief Engineer Montgomery Fletcher, U. S. N., under whose superintendence the work was carried on, and it is largely due to his untiring activity and attention that the extensive repairs and alterations made on the *Jeannette* in the department of steam-engineering were brought to such a speedy and successful conclusion.

NEW ENGINES, ETC.

Nipsic (3d rate).—New engines of the compound type have been erected in the vessel, connected, and tested under steam. New boilers, designed by the bureau, have been built at the navy-yard, Washington, D. C., placed on board, and the following extracts from report of a board of engineer officers shows them to be of a successful type:

* * * The water at no time showed a disposition to foam, which must be accepted as quite satisfactory evidence that under the conditions of the trial the circulation of the water in the boilers was all that could be desired and the steam-room ample.

The water in the river during greater part of the trial was very muddy and the tide low, so much so as to bring the bottom of the ship (two-thirds of the time) in contact with the accumulated mud near the wharf, and this, from necessity, had to be used more or less mixed with the feed-water.

The water-valves for relieving cylinders of water usually carried over by foaming, or other causes, did not have to be used during the trial, which is another evidence that the boilers did not prime or lift the water.

The boilers were perfectly tight before, during, and after the trial, and their position, with arrangement in the ship, affords excellent opportunities for repairs; in fact every part of the boilers, fronts, backs, and sides, are accessible, and the whole is a complete success. * * *

Experience having shown the unreliability of the single-furnace boiler as constructed and proportioned heretofore in the naval service, a different type of boiler, designed by the bureau, having two furnaces in each, was built at the navy-yard, Washington, D. C., and placed on board the *Nipsic*.

Particular attention has been paid in these boilers to accessibility of interior for examination, cleaning, and repair.

Galena (3d rate).—New engines of the compound type and new boilers, designed by the bureau, have been completed and are now being erected in the vessel at the navy-yard, Norfolk, Va. The ship will be ready for sea, in the engineer department, by the latter part of December. The new boilers of this vessel were originally designed with a single furnace, but experience having shown that their proportions and arrangements were faulty, a change was made in the type by substituting two furnaces and otherwise modifying them so that they are similar to those adopted for the *Nipsic*.

Mohican (3d rate).—New engines of the compound type and new boilers of the type adopted for the *Nipsic*, designed by the bureau, are being forwarded to completion and will be ready for service by the time the ship is prepared to receive them.

Monadnock (3d rate).—New boilers, designed by the bureau, have been completed, shipped to California, and stored in the navy-yard, Mare Island.

THE DOUBLE-TURRETED MONITORS.

In connection with these iron-clads I would respectfully renew the recommendations made under date of February 13, 1879, as follows:

* * * It will require from eighteen months to two years to build, and erect on board, complete and ready for steaming, the motive power of these vessels, while but a few months will be called for, in case of emergency, to put on board the turrets now on hand, and to supply the armature. If the machinery was completed, the vessels could be steamed to the navy-yard nearest the point of their construction, and put under our care and control, ready, in the engineer department, for immediate service.

I would, therefore, in view of what I have stated in the foregoing, recommend that

an appropriation be made for the completion, and erection on board, of the machinery for these vessels, as follows, viz:

For Puritan steam-machinery	\$420,000 00
For Amphitrite steam-machinery	230,000 00
For Terror steam-machinery	230,000 00
For Monadnock steam-machinery	285,000 00
Total	1,165,000 00

Miantonomoh (3d rate). New machinery, boilers, &c. have been completed, erected on board, connected, and a preliminary trial under steam has been made, with very satisfactory results, as is shown by the following extract from the report of the board of engineer officers appointed to conduct the trial, under date of May 15, 1879:

* * * The main engines and boilers have been sufficiently tested to enable us to form the opinion that the different parts are properly proportioned and that the machinery is well designed for the end proposed, and with ample strength in the various parts. * * *

As soon as practicable it is the intention to subject the motive power of this iron-clad to the usual dock trial of seventy-two consecutive hours under full steam pressure, with the vessel secured to the wharf. The following exhaustive description of the motive power, and data connected therewith, of this vessel is submitted in connection with the foregoing.

NEW YORK CITY,
September 25, 1879.

SIR: We have respectfully to report having assembled at the Morgan Iron Works, in this city, as a board of naval engineer officers, convened in accordance with the following order:

NAVY DEPARTMENT,
BUREAU OF NAVIGATION AND OFFICE OF DETAIL.
Washington, January 14, 1879.

SIR: You are appointed president and senior member of a board to convene at the Morgan Iron Works, New York City, on the 20th instant, to examine the machinery of the United States double-turret monitor *Miantonomoh* and determine the weights thereof.

Chief Engineer John H. Long, U. S. N., and Passed Assistant Engineer H. N. Stevenson, U. S. N., will be associated with you on this duty.

The board will send their report to the Bureau of Steam-Engineering.

Detailed instructions for the guidance of the board will be sent by the Bureau of Steam-Engineering.

On the completion of this duty, resume your regular duties.

By direction of the Secretary.

Respectfully,

W. D. WHITING,
Chief of Bureau.

Chief Engineer ALEXANDER HENDERSON, U. S. N.,
New York.

And we have to submit the following report in accordance with the instructions accompanying the above, viz:

NAVY DEPARTMENT,
BUREAU OF STEAM-ENGINEERING,
Washington, D. C., January 14, 1879.

SIR: The following instructions are furnished by the Bureau of Steam-Engineering for the guidance of the board, of which you are president, in the examination ordered upon the machinery, boilers, and dependencies of the United States iron-clad *Miantonomoh*.

The board will submit, in its report, a careful and exhaustive statement of the weights in detail of every piece of the motive machinery proper and its auxiliaries, as well as the boilers and their dependencies.

These weights will, so far as practicable, be enumerated under the four heads of wrought iron, cast iron, composition, copper, in boilers and engines.

The report will show to what extent the original drawings furnished by the Bureau of Steam-Engineering for the guidance of the builders have been departed from, by whose authority these changes were made, and whether they lessened the cost of construction or tended to increase its efficiency.

The board will prepare drawings showing plainly the nature of any changes or alterations made, which will be inclosed with the report.

The board will ascertain with all practicable accuracy the weight of water contained in each boiler at the average height for steaming, and said height being stated in the report.

In conclusion, the bureau desires the board to exercise its discretion in this examination, and include in its report such matters connected with this ship, her motive power, and its auxiliaries, as shall be of practical value to the department.

Respectfully,

W. H. SHOCK,
Chief of Bureau.

Chief Engineer ALEXANDER HENDERSON, U. S. N.,
President of the Board, New York City.

The forwarding of this report has been very much delayed in consequence of the incompleteness of certain authorized alterations and additions in the engine-work, and also by the detail of the members of the board on the trials of the steam-machinery at Chester, Pennsylvania, and even at this late day there are a few minor details in the weights which are left in blank until the final completion of the hull of the vessel will permit the work to be connected and correctly ascertained.

As far as it was possible to procure them, the weights were taken from the books of the builder of the steam-machinery, and where these could not be accurately ascertained, as of finished work, they were computed from the detail drawings of the engines furnished by the Bureau of Steam-Engineering, and are presented in tabulated form of the various kinds of materials entering into their construction.

The departures from the aforementioned original drawings, furnished by the Bureau of Steam-Engineering for the guidance of the builders, are set forth under their appropriate head in the report, together with the authority under which they were made.

We have given careful consideration to this matter, and we do not find in any case that changes in design or detail have been made to cheapen the cost of construction in either weight, labor, or quality of material, but solely with a view to increase the power and efficiency of the motive machinery.

The drawings required in the bureau's instructions, showing plainly the nature of the details of the alterations made, are embodied in the report.

In order to carry out the final clause of the instructions of the bureau, and without entering upon any detail description of the hull construction of this vessel, we have deemed it best to preface our report with the following tabular statement of the general character and principal dimensions of the present iron double-hull vessel now nearly completed at Chester, Pa. The dimensions of the vessel were procured from the naval constructor in charge of its building at the Delaware River Iron Works.

Tabular statement of the general dimensions of the iron hull of double-turret monitor Miantonomoh.

Length between perpendiculars.....	250' 0"
Length on water-line.....	259' 0'
Length over all.....	262' 0"
Breadth of beam back of armor.....	50' 0"
Breadth of beam over armor.....	55' 2"
Depth of hold.....	14' 0"

Tonnage:

Displacement at load draft.....	tons..	3,825
Displacement per inch at load draft.....	do.....	27.67
Depth base-line to top of armor.....	10' 4"	
Height of armor-shelf above base-line.....	8' 10"	
Height of deck above water—amidships.....	2' 6"	
Area of amidship section.....	sq. ft..	716.5
Thickness of side armor, amidships.....	7"	
Thickness of side armor, ends.....	5"	
Thickness of wood backing.....	20 $\frac{1}{4}$ ", 22 $\frac{1}{4}$ ", 24 $\frac{1}{4}$ "	
Thickness of deck armor.....	2"	
Weight of side armor—solid plates.....	lbs..	780,320
Weight of turrets—two—with glacis.....	tons..	391
Weight of deck armor:		
Weight of armored smoke-pipe.....	lbs..	89,106
Weight of armored ventilator.....	do.....	54,274
Weight of hull, launching:		
Weight of wood, backing:		
Weight of armor bolts:		
Weight of pilot-house.....	tons..	52.23
Weight of engines and all dependencies.....	do.....	571.709
Weight of boiler, water, and dependencies (ex-bunkers).....	do.....	619.512
Weight of coal contained in bunkers.....	do.....	300
Number of turrets.....		2
Diameter of outside.....	22' 9"	
Diameter of inside.....	21' 1"	
Thickness of turrets.....	10"	
Height of turrets above deck.....	9' 0"	
Number of guns (kind undetermined).....	4.	
Height of battery above deck.....	7' 0"	
Diameter of armored smoke-pipe.....	10 0	
Height of armored smoke-pipe.....	9 0	
Thickness of armored smoke-pipe.....	10"	
Diameter of armored air-duct.....	7' 4"	
Height of armored air-duct.....	6' 0"	
Thickness of armored air-duct.....	8"	
Diameter of armored pilot-house.....	7' 10"	
Height of armored pilot-house.....	6' 4"	
Thickness of armored pilot-house.....	10"	
Area through smoke-pipe grating.....	sq. ft..	45.2
Area through main air-duct.....		
Area counterpoise rudder.....	sq. ft..	74
Area vertical longitudinal section.....		

In the accompanying tracings Nos. 1, 2, and 3 are shown the lines of the vessel, transcribed from the original plan bearing date of Bureau of Construction and Repair of——, 187—, and approved by the chief naval constructor, Isaiah Hauscom, and we are informed that they have been strictly adhered to; and in Nos. 4, 5, and 6 are shown the amidship section, the ram, and the overhang protecting the rudder and screw-propellers.

In the tracing (No. 4) with the amidship section are shown the method of constructing the inner and outer iron hulls and bracket-plates connecting the same and deck-beams, together with a section of the deck armor and side armor with backing of wood. In No. 5 are shown the wrought-iron ram and its fastenings extending to forward collision bulkhead. This forging has been constructed of selected material of the very best quality, and fastened to the hull with bracing as strongly as iron plating, &c., can be secured together.

In No. 6 is shown the overhang with the rudder and propellers, the former only slightly equipoise, and is to be connected not only with the ordinary hand-steering arrangements, but also with steam cylinder-steering engines, more fully described hereafter.

These three latter drawings were reduced from the working plans of the ship-yard, and are believed to be correct in their respective details.

The side armor of the original Miantonomoh consisted of laminated iron plates, five in number, and each with a thickness of $\frac{1}{8}$ inch, secured together by bolts of — inches diameter, or a total thickness amidship of $4\frac{1}{8}$ inches.

The present side armor has been made of solid plates of rolled iron having a thickness of 7 inches amidship and 5 inches on the forward and 5 inches on the after part of the vessel; the amidship or 7-inch plates having a length of 11 feet and $2\frac{1}{2}$ feet in width.

The wood backing is of oak, with a thickness of $24\frac{1}{2}$ inches, to which the armor plates are secured by bolts of $2\frac{3}{4}$ inches diameter. Accessibility to these armor bolts is secured by wing passages extending throughout the entire length of the vessel and opposite the engines and boilers into wide passage-ways for passing from end to end.

The base rings, upon which the turrets were to revolve, are shown in drawing No. 7. They were completed and fastened to the armored deck of the vessel in accordance with the plan A, but this was afterward changed by orders from the Bureau of Construction, and the work of fitting them with the base rings and glacis, as shown at B, is now in progress.

The weights given in the tabulated statement are those of the original turret and pilot-house and armored smoke-pipe and ventilator. The turrets were in the original vessel composed of ten laminated plates of $\frac{1}{4}$ of an inch thickness each, and a similar method of construction was also adopted for the other armored parts mentioned.

It is now understood to be in contemplation the putting on of these three latter parts with solid rolled plates, by which means and retaining the same dimensions and with only a slight increase of the weights a far greater resistance to shot will be obtained.

In the case of the side armor alone it is estimated that the increased thickness and substitution of solid plating has increased by — per cent. its power of defense.

All the turret-turning machinery of the original vessel as shown in tracing No. 8 has been placed on board of the present ship, but its alteration is now under consideration by the department, having in view the placing of it in the lower turret chamber and thus saving the great and otherwise required space that it now occupies both within and outside of the upper chamber bulkheads. The present gear is radically defective in the fact that the power is transmitted through but one pinion, so that the breaking of a single tooth in the main wheel renders the turret inoperative. This was a difficulty several times met with in the former monitors, and an error of construction that should not be retained in a new vessel.

By reference to the tracing following, or No. 9, there will be seen the manner by which this can be most readily overcome, and that, too, at a small expense commensurate with the advantages to be gained. The time requisite for a complete revolution of these turrets should not exceed 30 seconds. In addition to the ordinary key for raising the turrets from base ring, the spindle is fitted with an hydraulic hoist, consisting of a collar secured to the spindle upon which operate four rams receiving their power from two small pumps worked as shown in tracing No. 10. This whole matter has been made the subject of a special report by the senior member of this board under date of a letter to the Navy Department of June 19, 1879.

It was originally contemplated to cover the hull of this vessel with oak planking and copper sheathing, to prevent the corrosion and fouling

to which iron vessels, especially iron-clads, not so frequently in motion, are subject in salt water, but this design was never carried out.

There was also at one time placed upon the deck of this vessel an iron house, surrounding the armored smoke-pipe and extending forward and aft of same about 75 feet with a width of 36 feet, but this has also been removed, and with undoubted benefit too, and the officers' apartments will be placed, as in the original monitors of this class, in the after end beneath the armored deck.

Additional water-tight bulkheads have also been fitted, and a consequent minor change in the original plan of arrangements below deck. A complete drawing is in preparation, being a general plan and vertical section through the ship, from which the details of the various arrangements as actually completed can be clearly seen.

There are 9 main water-tight bulkheads, dividing the vessel into separate compartments, while the inner and outer hulls, or rather space between them, is divided by solid frames into 22 compartments, which are connected with three large wrecking steam-pumps of the Blake pattern, having cylinders of 16" and 16" respectively for the steam and water and a capacity for the discharge of 1,000 gallons per minute for each pump.

These pumps are in addition to the engine steam-pumps and bilge injections connected with the condenser circulating pumps. The above pumps are called for in the construction contract for hull, and it is to be regretted that they have not air-pump cylinders connected with them, so that their power might be utilized for either forcing fresh air into these spaces between the frames of the hull or exhausting the foul air, as might be required.

In the matter of the ventilation of this vessel, the improvement over the original *Miantonomoh* will be a great step forward. The first vessel had turret-blowers only, distributing the air throughout the vessel by means of ordinary revolving fans, and with said air all the smoke from the turrets when in action, and there were no means of exhausting the foul air from the sleeping quarters of either officers or crew.

There have already been fitted in the machinery compartment, two centrifugal blowers, the general plan of which with their engines is shown on tracing No. 11, of 7 feet in diameter by 3 feet in width, intended for about 500 revolutions per minute, and with a capacity for 20,000 cubic feet of air from each blower. Their duty will be for the air supply to the boiler furnaces, which will consume about 5,000 pounds of coal per hour, but they have also been connected with the main air-duct, so that in case of necessity they can also be used for the general ventilation of the vessel. The supply of air is received through the main ventilator, which will be extended above the armored portion to a height of about 25 feet above the deck.

The motive power of these blowers consists of two direct action engines on each fan; one engine is sufficient for the purpose, but in a matter of so great importance to the safety as well as efficiency of the vessel it was deemed better to have the spare engine ready for use in case of any accident. Both the blowers and their engines were manufactured by the Sturtevant Blower Company of Boston, Mass.

By reference to tracing No. 9 will be shown the arrangement of blowers for the ventilation of the forward and after sections of the vessel respectively. There are to be two in each turret, and connected with the main air-duct of the vessel, so as to communicate also with the engine and fire-room in case of necessity. This communication will be regu-

lated by suitable valves, which are made water-tight where they pass through the water-tight compartments of the ship.

In the same report of June 19, 1879, their use is recommended, but they differ from the engine-room blowers, in the fact of their being reversible or exhausting in their action.

Following the red arrows the supply of air is received from the atmosphere down through the turrets, the valve A and A¹ being open, and thence to the distributing pipes, but when it is desirable to exhaust the foul air from below the aforementioned valves are closed while those at B and B¹ are opened.

The supply being in either case to the center of the blower, it is plain that this current of air must be reversed without changing either the speed or motion of the revolving fans. As with the engine compartment blowers, they are also fitted with double engines with each cylinder of capacity sufficient to do the work required, namely, of supplying from each blower 10,000 cubic feet of air per minute.

The plan of exhausting has many advantages over forcing the air in, especially where adequate arrangements have not been made for its expulsion. This method also avoids strong and concentrated drafts and the stirring up and driving into corners of the vitiated air, from which it is not immediately expelled.

Although the refitting of the turret-blowers was embodied in the contract for the hull construction, yet it is so plainly a matter of steam-engineering that it was investigated by a board of engineer officers, of which Chief Engineer Harman Newell was senior member, who reported the results of their examinations under date of June 29, 1876.

The matter was subsequently referred to a board, over which Chief Engineer A. Henderson presided, and their recommendations embodied in their report of August 31, 1877, which was approved by the present Engineer in Chief under date of October 10, 1877.

The details, as embodied in a subsequent report of Chief Engineer A. Henderson of June 19, 1879, are now being carried out, but attention is respectfully called to that part of the first recommendation which provides for small ventilators (perforated holes through armored deck) of height sufficient to keep out the water and to insure a supply of fresh air both to the officers' quarters and berth-deck when the blowers are being run with the exhausting valves in use.

The Miantonomoh being the first, it is to be expected that her cost will be greater than that of the subsequent vessels of same general design, for in this vessel have not only there been numerous alterations, but also many important and expensive additions not contemplated or foreseen in the original contracts.

It was originally contemplated to have fitted to the vessel two pair of horizontal direct back-action engines of the same pattern of those used in the 800 horse-power sloops of Alliance class, and so was the original contract entered upon.

Subsequently, as recommended by a board of officers, these plans were substituted by the adoption of an improved arrangement of twin screw-engines so arranged that they could be placed in a smaller space. This design, which is shown in elevation and plan on tracing No. 12 was made the subject of a patent numbered 171,074 and issued on December 14, 1875. On tracing No. 13 is shown a general plan of the entire machinery, giving the space occupied by the engine and boilers.

The engines were constructed in New York, at the Morgan Iron Works, and shipped to Chester, Pa., where the boilers were built and the whole have been erected on board of the vessel.

A trial of the engines was made and reported upon on May 15, 1879, in which the opinion of the board was expressed, viz:

The main engines have been sufficiently tested to enable us to form an opinion that the different parts are properly proportioned, and that the machinery is well designed for the end proposed and with ample strength in the various working parts.

We are also of the opinion that the work done by the contracting parties is of the best character in material and fitting.

After this trial it was recommended that an additional small cylinder be added to the air-pump engine, which was carried out and a report made thereon of August 5, 1879. The armor plating of the ship is now being put on, and as soon as this is completed and the ventilating engines connected with the air-ducts, an extended trial under actual steaming will be carried out.

The coal capacity of the bunkers has been carefully measured, and with an allowance of 42.5 cubic feet per ton there can be stowed 331.8 tons, and in the accompanying tracing, No. 14, is given a general plan of the bunkers with the cubic capacity of the several parts marked thereon.

The actual stowage capacity, making allowance for beams, small pockets, ventilator passages, &c., can be assumed to be about 300 tons of ordinary steamer broken anthracite coal.

GENERAL DESCRIPTION OF ENGINE.

The engines are of the twin screw direct-acting compound type. The cylinders of one engine are placed opposite and inclined to those of the other engine, with the high pressure cylinder of one opposite the low pressure cylinder of the other. The cylinders rest upon brackets springing from the crank-shaft pillow-block frames, which are supported upon the condensers, the condensers forming the base of the engines.

Each cylinder is made a shell or casing inclosing a receiver to which the valve-chests are attached. Each cylinder also forms a steam-jacket which surrounds an inner wearing cylinder, which is cast separately and firmly bolted in place.

Each valve-chest incloses a main slide and cut-off valve; the main valves are worked by means of eccentrics and Stephenson's links coupled directly with the valve-stems.

The cut-off valves are operated by separate eccentrics connected directly with the stems, and so fitted that they can be adjusted, while the engines are in motion, to cut-off between the limits of $\frac{1}{4}$ and $\frac{3}{4}$ of the stroke of the piston. All the cylinders are fitted with relief and pass-over valves operated by means of levers in the engine-room. The pistons of the high pressure cylinders have one piston-rod, the pistons of the low pressure cylinders have two rods. The piston-rods are attached to the crossheads, which run on guides made on the pillow-block frames.

The connecting rods are fitted with straps, gibs, and keys, and coupled each by a forked end to the crossheads. The crank-shafts are placed 9 feet each side of the center line of ship; each shaft is made with two cranks at right angles to each other, and are of the built-up type with suitable counter-balances for the engines; each shaft is mounted on three journals and united to the line shafting by disengaging coupling.

The steam is exhausted into the condensers through passages made in the brackets and pillow-block frames. The condenser tubes are placed fore and aft; the refrigerating water circulating through one-half of the tubes and returning through the others to the forward end of the condenser, thence discharging through the outboard delivery valve: the

tubes are packed with Lighthall's paper packing, as shown in drawing No. 33.

The reversing cylinders are placed on the engine gallery above the condensers and between the cylinders, and set upon rock shafts which connect with their respective links.

The air and circulating pumps are worked independently of the main engines and each other, and are placed forward of the engines, the circulating pumps on the port side and the air-pump on the starboard side of the ship.

The circulating pumps are two in number (see tracing No. 15), and are centrifugal in their action, being operated by a pair of upright overhead cylinders, and so arranged that either or both pumps can be used at will. It is intended that they shall also be used as bilge-pumps, and the necessary valves have been provided, but are not yet permanently located, awaiting the completion of additional water-tight bulkhead in process of erection between the engine and fire-rooms.

The air-pump is vertical and double acting and operated by a steam-cylinder immediately above it, as shown in tracing No. 16. The additional cylinder was a matter of after consideration, and was fitted in order to insure the prompt starting of the engine and to equalize its motion when in operation.

Connected with this pump and upon the same crosshead are two single-acting feed-pumps inclosed in the air-pump chest.

Attached to these pumps is a Selden's water purifier or filterer, the details of which are shown in tracing No. 17, and the entire feed-pump supply passes through this apparatus before entering the boilers.

In addition to these feed-pumps there are two horizontal steam-pumps of the Blake pattern for boiler-feeding only, having water-pistons of 6 inches diameter and a stroke of 12 inches; they are placed in the forward end of the fire-room.

Two other steam-pumps of similar pattern, but with 7-inch water-cylinders and 12-inch stroke, are located in the after part of engine-room, and in addition to the usual attachments for feed, fire, and bilge-pumping, are arranged for circulating water through the auxiliary condenser.

The following are the dimensions of the principal parts of the engines:

Diameter of high-pressure cylinders, 32 inches.

Diameter of low-pressure cylinders, 48 inches.

Length of stroke, 42 inches.

Diameter of piston-rods (low-pressure), $4\frac{1}{2}$ inches.

Diameter of piston-rod (high-pressure), 5 inches.

Displacement of high-pressure piston per stroke, 19.309.

Displacement of low-pressure piston per stroke, 43.657.

Effective ratio of cylinders, 1 to 2.261.

Capacity of receiver, 83.906 cubic feet.

Capacity of low-pressure steam-chest, 16.524.

Capacity of receiver, including low-pressure steam-chest 100.43 cubic feet.

Ratio of low-pressure cylinder to receiver, 1 to 1.922.

Ratio of low-pressure cylinder to receiver, including low-pressure steam-chest, 1 to 2.300.

Clearance inboard end, $\frac{5}{8}$ inch.

Clearance outboard end, $\frac{3}{8}$ inch.

Total mean clearance in length at one end of high-pressure cylinder, 3.458 inches of stroke.

Total mean clearance in length at one end of low-pressure cylinder, 2.649 inches of stroke.

Area of steam-ports of high-pressure cylinder, 72 inches.

Area of exhaust-port high-pressure cylinder, 72 inches.

Area of steam-ports of low-pressure cylinder, 114 inches.

Area of exhaust-ports of low-pressure cylinders, 152 inches.

Area of exhaust-ports to condenser, 126 inches.

Travel of valve of high-pressure cylinder, $5\frac{1}{2}$ inches.

Travel of valve of low-pressure cylinder, $5\frac{1}{2}$ inches.

Diameter of main valve-stem (steel), $2\frac{1}{2}$ inches.

Diameter of cut-off valve-stem (steel), 2 inches.

Diameter of crosshead-journal, $5\frac{1}{2}$ inches.

Length of crosshead-journal, 5 inches.

Length of connecting-rod between centres, 84 inches.

Diameter of neck, crank-pin end, 5 inches.

Diameter of crosshead end, 5 inches.

Diameter at center, $6\frac{1}{2}$ inches.

Diameter of crank-shaft, $10\frac{1}{2}$ inches.

Length of crank-shaft, 14 feet 6 inches.

Diameter of crank-pin journals, $9\frac{1}{2}$ inches.

Length of crank-pin journals, 15 inches.

Thickness of web of cranks, $5\frac{1}{2}$ inches.

Number of main journals to each crank-shaft, 3.

Diameter of main journals, $10\frac{1}{2}$ inches.

Length of main journals (outboard), $17\frac{1}{2}$ inches.

Ratio of length to diameter of crank-pin journal, 1 to 1.55.

Ratio of length to diameter of crank-shaft journal (outboard), 1 to 1.7.

Length of main journals (centre), 27 inches.

Ratio of length to diameter of crank-shaft journal (center), 1 to 2.63.

Diameter of line-shafting, $9\frac{1}{2}$ inches.

Diameter of line-shaft journals, 10 inches.

Length of line-shaft journals, 22 inches.

Ratio of length to diameter of line-shaft journal, 1 to 2.2.

Length of thrust section-line shafting, 20 feet.

Intermediate section of line shafting, 21 feet.

Length of propeller-shaft, 43 feet.

Length of thrust-bearing, $23\frac{3}{4}$ inches.

Diameter of thrust-collars (inside), 10 inches.

Diameter of thrust-collars (outside), 14 inches.

Number of thrust-collars, 11.

Area of thrust-collars, 829.378 square inches.

Diameter of propeller-shaft (including composition casing), $10\frac{3}{4}$ inches.

Length of lignum-vitæ bearing inboard end of stern-pipe, 24 inches.

Length of lignum-vitæ bearing outboard end of stern-pipe, 24 inches.

Length of lignum-vitæ of hanging bearing, 54 inches.

Length of crosshead-gibs, 8 inches.

Breadth of crosshead-gibs, 6 inches.

Area of one gib, 48 square inches.

Diameter of air-pump, 24 inches.

Length of stroke, 26 inches.

Area of foot-valves, 225.19 square inches.

Area of delivery-valves, 154 square inches.

Area of receiving vapor-valves, 51.924 square inches.

Area of delivering vapor-valves, 51.924 square inches.

Diameter of air-pump rod, 3 inches.

Diameter of steam-cylinder to work air-pump, 20 inches.

Length of stroke, 26 inches.
 Diameter of piston-rods, 2 inches.
 Number of piston-rods, 2.
 Capacity of circulating-pumps, 2,800 gallons each per minute.
 Diameter of discharge-pipe of circulating-pumps, 14 inches.
 Diameter of steam-cylinders to work circulating-pumps, 11 inches.
 Length of stroke, 9 inches.
 Length of condenser-tubes (exposed), 8 feet 6½ inches.
 Diameter of condenser-tubes (outside), ½ inch.
 Number of condenser-tubes, 3,024.
 Area of condensing surface, 4,225.19 square feet.
 Diameter (outside) of main steam-pipe, 12¼ inches.
 Diameter of each propeller, 12 feet.
 Initial pitch, 17 feet.
 Mean pitch, 19 feet.
 Terminal pitch, 21 feet.
 Number of blades, 4.
 Length of blades (maximum) in direction of axis, 29 inches.
 Length of blades (minimum) in direction of axis, 9.75 inches.
 Length of blades at hub in direction of axis, 21.87 inches.
 Surface of blades, 54.976 square feet.
 Length of hub, 30 inches.
 Diameter of forward end, 19 inches.
 Diameter of after end, 15 inches.
 Diameter at greatest part, 21 inches.
 Distance between engine-room bulkheads fore and aft, 26 feet 6 inches.
 Breadth athwartships at base of engines, 29 feet.
 Breadth athwartships under main-deck, 22 feet 3 inches.
 Space occupied by the engines over steam-chests, fore and aft, 14 feet.
 Space occupied by the engines over steam-chests athwartship, 20 feet 5 inches.
 Distance between centers of the two crank-shafts, 18 feet.
 Total height of engines above bed, 12 feet 1¾ inches.
 Height of bed above inner (bottom) plating, 11 inches.
 Height of engines above inner plating, 12 feet 11 inches.
 Height of main steam-pipe above inner plating, 12 feet 11¼ inches.
 Height of crank-shaft center above bed, 30 inches.
 Distance between center line of high and low pressure cylinders, 5 feet.

GENERAL DESCRIPTION OF BOILERS.

The boilers, six in number, are all of the same dimensions and placed forward of the engines, three on each side of the vessel, with the fire-room between them. They are so arranged that any one or more can be used in connection with either pair of the main engines. The two after boilers are connected so as to be used singly or collectively as auxiliary boilers for operating the blowers, pumps, &c. Each boiler rests on and is firmly secured by means of suitable straps to two wrought-iron saddles (one at each end of the boiler) which are securely fastened to the ship. The edges of the saddle-plates of the boilers abut upon each other, and are secured together by means of double butt-straps, thus forming a continuous support along the front and back of the three boilers on a side.

The uptakes projecting beyond the front heads connect all the boilers on a side, and both uptakes (at their center fore-and-aft line) discharge their products of combustion into one smoke-pipe, situated in a vertical

line over the keel. The floor-plates in fire-room and about passage-ways are all of indented wrought-iron plates.

Each boiler is fitted with a sheet-brass dry pipe, and with an independent safety stop, feed, surface, and bottom blow-valve, with suitable connection pipes to each, and all necessary gauges, &c. All valves connected with the boilers are of composition.

All seams not in contact with the fire are double riveted, the sheets planed on the edges, butt-jointed and covered with a butt strap the same thickness as the sheet, with the exception of the transverse seams of the shell, which are lapped.

The heads of each boiler are thoroughly braced by means of rods and stay plates, the flat parts about the back connections, &c., by socket bolts placed at regular distances apart.

There are two cylindrical steam-drums on each side of the vessel, placed horizontally in the spandrels over the boilers and parallel to their axes. The outboard end of drums are each connected by means of a pipe with the boiler stop-valves, and the inboard ends to a superheating pipe situated in and running from aft forward along the uptakes, thus making a steam connection to all the boilers on one side. The superheating pipe returns again parallel to itself, along the uptake, and connects to the main steam-pipe.

DIMENSIONS OF BOILERS.

Diameter (outside), 12 feet $4\frac{1}{2}$ inches.

Diameter (inside), 12 feet 3 inches.

Length outside (exclusive of furnace doors, which project 6 inches from the front head), 9 feet $10\frac{3}{4}$ inches.

Number of furnaces in each boiler, 3.

Diameter (internal) of furnaces, 38 inches.

Length of furnace, 7 feet 3 inches.

Height of center of middle furnace, above tangent, to lowest point of shell, 2 feet 1 inch.

Height of center of side furnace, above tangent, to lowest point of shell, 3 feet 8 inches.

Distance from center of boiler to center of furnaces, 4 feet 1 inch.

Distance from center of middle furnace to center of side furnace, 3 feet $7\frac{1}{2}$ inches.

Thickness of shell, $\frac{3}{4}$ inch.

Thickness of heads and tube-sheets, $\frac{5}{8}$ inch.

Thickness of crown-sheet, $\frac{1}{2}$ inch.

Thickness of back connections, $\frac{3}{8}$ inch.

Number of drawn brass tubes to middle furnace, 72.

Number of drawn brass tubes to each side-furnace, 69.

Total number of tubes in one boiler, 210.

Length of tubes, 7 feet 3 inches.

Diameter (outside) of tubes, 3 inches.

Diameter (inside) of tubes, 2.782 inches.

Distance between centers of tubes, horizontally, $4\frac{3}{4}$ inches.

Distance between centers of tubes, vertically, $4\frac{1}{4}$ inches.

Number of head braces, 37.

Diameter of head braces, $1\frac{1}{4}$ inches.

Distance between centers of braces, 12 inches.

Depth of back connections, including thickness of metal, 27 inches.

Diameter of socket-bolts, 1 inch.

Distance between centers of socket-bolts, 7 inches.

Diameter of safety-valve to each boiler and superheating pipe, 6 inches.

Diameter of each stop-valve to each boiler, $6\frac{1}{2}$ inches.

Diameter of check-valve to each boiler, $2\frac{1}{2}$ inches.

Diameter of bottom blow-valve to each boiler, $2\frac{1}{2}$ inches.

Diameter of surface-blow to each boiler, 2 inches.

Diameter of feed and bottom blow-pipes, $3\frac{1}{2}$ inches.

Diameter of surface blow-pipes, 2 inches.

Diameter of each steam-drum, 36 inches.

Length of each steam-drum, 8 feet 6 inches.

Thickness of shell of steam-drums, $\frac{3}{8}$ inch.

Thickness of heads of steam-drums, $\frac{1}{2}$ inch.

Length of grate, 6 feet 6 inches.

Width of grate, 3 feet 2 inches.

Mean height of crown-sheet above grate, $20\frac{1}{2}$ inches.

Area of grate in one furnace, 20.5 square feet.

Area of grate in one boiler, 61.5 square feet.

Area through tubes for draught, side furnace, 2.846 square feet.

Area through tubes for draught, middle furnace, 2.97 square feet.

Total area through tubes in one boiler, 8.662 square feet.

Ratio of the grate surface to calorimeter through the tubes, 1 to .1408.

Heating surface in crown sheets of one boiler, 106.944 square feet.

Heating surface of back connections of one boiler, 167.211 square feet.

Heating surface of front connections of one boiler, 57.333 square feet.

Heating surface in tubes of one boiler, 1,132.029 square feet.

Total heating surface in one boiler, 1,463.517 square feet.

Area through back connection of center furnace, 5.055 square feet.

Area through back connection of wing furnaces, 14.444 square feet.

Total area through back connections of one boiler, 19.5 square feet.

Ratio of the grate to the heating surface, 1 to 23.79.

Diameter of smoke-pipe, 8 feet 3 inches.

Area of smoke-pipe, 53.456 square feet.

Area of openings through grating of smoke-pipe, 45.2 square feet.

Diameter (internal) of armored smoke-pipe above grating, 10 feet 1 inch.

Diameter (internal) of armored smoke-pipe below grating, 9 feet 9 inches.

Total height of smoke-pipe above grate, 50 feet.

Thickness of armor smoke-pipe above grating, 8 inches.

Thickness of armor smoke-pipe below grating, 10 inches.

Height of armor smoke-pipe above deck, 6 feet.

Ratio of grate surface to area through smoke-pipe, 1 to .14485.

Ratio of grate surface to area through smoke-pipe grating, 1 to .1225.

Ratio of grate surface to area through back connections, 1 to .31707.

Superheating surface of each of the end boilers, 14.171 square feet.

Superheating surface of the intermediate boiler, 25.842 square feet.

Superheating surface of two pipes, $15\frac{3}{4}$ inches in diameter and 49.5 feet long, with connections to drums, 210.458 square feet.

Total superheating surface of the three boilers on one side, 264.64 square feet.

Weight of sea-water in one boiler, 6 inches above tubes, 32,752 pounds.

Weight of sea-water in tons of 2,240 pounds each in one boiler, 6 inches above tubes, 14.621 tons.

Steam room in one boiler, 244.069 cubic feet.

Steam room in one steam drum, 55.893 cubic feet.

Steam room in superheating pipes and connections to drums on one side, 60.905 cubic feet.

Steam room in main steam-pipe (one side), 27.641 cubic feet.

Total steam room in boilers, drums, superheating and steam pipes on one side, 941.539 cubic feet.

Ratio of displacement of high-pressure pistons to total steam room, 1 to 48.658.

Distance between fire-room bulkheads, lengthwise (mean), 41 feet.

Distance between fire-room bulkheads, athwartships, 35 feet.

Space occupied by the boilers, lengthwise, 40 feet.

Width of fire-room at floor, 11 feet.

Width of fire-room at furnaces, 10 feet 1 inch.

Height of highest part of boiler-shell above inner plating of ship, 13 feet 5 inches.

Height of highest part of steam-drums above inner plating of ship, 13 feet 6 inches.

Space between boilers, 9 inches.

Space between forward boiler and fire-room bulkhead, $9\frac{1}{2}$ inches.

Space between after boiler and fire-room bulkhead, $14\frac{1}{2}$ inches.

Weight of sea-water in all boilers, 6 inches above tubes, 196,512 pounds.

Capacity of coal-bunkers in cubic feet, 14,102.

Capacity of coal-bunkers in tons of 42.5 cubic feet each, 331.8.

Number of days' coal at full steaming, 5.98.

Number of days' coal at 10 knots, 10.37.

STEERING-MACHINES.

There has been fitted to this vessel, and now ready for use, a steam steering-machine of the Sickles patent, and constructed by the Providence Steam-Engine Company. By reference to the tracing of this machine it will be seen that it consists of two half-trunk cylinders of 18 inches diameter, placed at right angles and acting on one crank-pin in a shaft above them. The valves, as shown in the section No. 22, are of the piston variety.

Upon the shaft is secured a deeply-grooved conical drum for the reception of the tiller-ropes, and the drum is so constructed that when the rudder is hard over the relative leverage is double of that when it is amidship, thus giving the most power to control the rudder when the resistance is the greatest.

To operate this machine an ordinary steering-wheel is placed on the shaft, and in connection with the valves by means of a cam; the moving of this wheel changes the cam and also the yoke and pin on the loose cam, and thereby the valves of the engine, starting them in the direction of the hand-wheel. The engines will continue to move until the cam and yoke are brought into the neutral position again.

The hand-wheel having ceased its motion, and being independent of the engines, as soon as the latter move the crank-shaft and drum through an equal distance it has brought both shafts to the same relative position as at starting, and consequently closed the steam-valves.

It is thus evident that the engine shaft follows in direction and moves through the same angle as the hand-wheel shaft, and simply stopping the motion of the latter stops that of the former.

Suitable stops are provided to obviate any undue strain from the engine when the rudder is hard over, and the shocks arising from the

force of the waves against the rudder are taken up by the cushion of the steam against the cylinder pistons.

The arrangements for connecting with, and disconnecting from, hand-steering are simple and immediate, and entirely independent of each other. An equilibrium valve in the steam-pipe near the cylinders equalizes the pressure on the engine at varying boiler pressures of steam.

The machine is situated in the forward turret and connected by overhead pulleys with the ordinary steering ropes. There is also a brass standard and grooved pulley for location in the pilot-house, and connected by wire ropes to the steering engines, so that prompt steering action can be easily maintained from the armored pilot-house above turret, or, in fact, from any part of the vessel where desired. An indicator of the rudder position is connected with the steering-wheel.

This machine is, however, by no means an experiment, being already in successful use in the Navy and numerous merchant steamers, and having been thoroughly tested.

There is also in process of erection a steam *steerer of the Manton patent*, as shown in tracing No. 23.

The main parts of the machine consist of a pair of horizontal cylinders, operating a pinion working into larger gear. Upon these gear-shafts are worms geared into a circular plate upon the rudder-head, as is already shown in the tracing.

The connection of this machine with a hand-steering mechanism has not yet been completed, being still under consideration. Upon its completion, it is understood that a competitive trial will be made of the two steam steerers in actual steering, and testing their relative merits in accuracy of steering, reliability, and facility of detachment, &c.

A *special steam pump* is also fitted in connection with the distilling apparatus, the arrangement of which is shown on tracing No. 24. It is of the pattern known as the Baird distiller and aerator, and fitted also with a filterer through which the water passes before reaching the tanks in the main hold.

Its capacity is about 2,500 gallons per diem, and as its application is common to many of our naval vessels, a detailed description is unnecessary.

By reference to tracing No. 25 will be seen the plan of *auxiliary condenser*, into which all the air and circulating engines, together with the turret blower, steering and anchor engines, exhaust, as also do the steam-pumps, &c.

By means of suitable valves these various engines can also exhaust into the atmosphere, the pipe for that purpose passing up through the gratings of the armored smoke-pipe.

Steam radiators of the Walton pattern are suitably located for heating the quarters occupied by both the officers and crew, and are provided with traps for the collection of the condensed steam.

Over the engine-room are *two large ventilators*, 15 inches in diameter; also, two of similar size over the forward end of fire-room; these two latter are arranged for the discharge of the ashes; the two over the after fire-room unite into one large ventilator.

All are provided with battle plates, and extend — feet above the main deck and passing through the hurricane deck.

Deck-lights have been provided wherever necessary over the engine-room, and also over the platform back of boilers, the latter, however, more with a view of permitting the escape of the hot air than for the purpose of light.

To still further reduce the heat on this platform behind the boilers, the upper portion of the bunker bulkhead has been fitted with large hinged doors, which lower when the coal is sufficiently reduced in the bunkers.

There is now in process of construction a *steam ash-hoister*, which will be operated by a pair of cylinders of 5 inches diameter and with 5 inches stroke of piston.

The engines (4) of the main blowers have a diameter of 10 inches with a piston stroke of 6 inches, and estimated for 500 revolutions per minute.

Regarding the *propellers* and their arrangements, the stern pipe in this vessel is of welded wrought-iron plates and most substantial in its construction. The shaft is supported in the usual way by lignum vitæ bearings, and its outboard end held up by a wrought-iron bracket, a plan of which can be seen by reference to tracing No. 6.

In the original design of the ship it was proposed to sheath the hull with wood, and the propellers were to be of composition and of the design given in tracing No. 26. This wood sheathing was subsequently changed, and with the plain iron hull it became necessary to make the screws of cast iron. They are of the Hirsch patent and with a mean pitch of 19 feet, and in tracing No. 27 are given all their detailed dimensions. It is a question with the Board if they be of sufficient area, but this is a matter that can only be determined by the result of actual steaming trials.

The *anchor windlass* shown in tracing No. 36 was built by the American Ship Windlass Company of Providence, R. I., and is of a kind well known and successfully applied in many ships.

On the deck below the windlass is suspended two steam cylinders at right angles to each other; the shaft, being vertical, projects through the deck and carries at its upper end a worm which meshes into a large gear-wheel fastened to the main shaft of the chain-drums. These chain-drums are so arranged that one or both can be connected to the shaft as desired. A hand-brake is provided for use in case of derangement to the steam-gear, also a friction-brake for use in paying out chain.

ALTERATIONS.

The alterations which have been made during the construction of this machinery, and the authority for making such changes, are as follows:

Boilers.

1st. The original drawing furnished by the bureau and dated May 14, 1875. (See tracing No. 28.)

2d. The subsequent drawing furnished by the bureau, without date. (See tracing No. 29.)

3d. The drawing furnished by the contractor, dated September 1875, and approved by the bureau officers, and from which the boilers were constructed. (See tracing No. 18.)

The following table exhibits the alterations which have been made from the original designs of these boilers :

	Original plan.	Subsequent plan.	As completed.
Diameter of shell	12 feet	12 feet	12 feet 3 inches.
Extreme length	10 feet 7 inches	10 feet 7 inches	10 feet 6 inches.
Diameter of furnaces	36 inches	36 inches	38 inches.
Number of tubes	191	197	210.
Front head	Outer flange	Outer flange	Reversed flange.
Bracing	Shown in tracing marked 28.	Shown in tracing marked 29.	Shown in tracing marked 18.
Steam-room	266.54 cubic feet ..	266.54 cubic feet ..	244.07 cubic feet.
Grate surface	62.25 square feet ..	63 square feet ..	61.5 square feet.
Heating surface	1,313.35 square feet	1,345.35 square feet	1,463.52 square feet.
Number of tubes	191	197	210.
Area through tubes	8.06 square feet ..	8.227 square feet ..	8.862 square feet.
Ratio of grate to heating surface.	1 to 21.101	1 to 21.355	1 to 23.937.
Length of furnace	6 feet 11 inches ..	7 feet	6 feet 6 inches.
Width of furnace	36 inches	36 inches	38 inches.
Number of stay-tubes .....	.....	.....	18.
Thickness of heads	$\frac{1}{2}$ inch	$\frac{1}{2}$ inch	$\frac{3}{4}$ inch.
Thickness of back connections	$\frac{1}{2}$ inch	$\frac{1}{2}$ inch	$\frac{1}{2}$ inch.
Thickness of tube-sheets	$\frac{1}{2}$ inch	$\frac{1}{2}$ inch	$\frac{1}{2}$ inch.
Water space	497.75 cubic feet ..	495.14 cubic feet ..	509.36 cubic feet.
Weight of water 6 inches above tubes.	32,005 pounds	31,637 pounds	32,752 pounds.
Weight of boiler	43,509 pounds	43,836 pounds	46,613 pounds.

Man-holes in steam-drums.

In the original design of the steam-drums, man-holes were not called for; they were subsequently cut and provided with rings, man-hole plates, yoke, &c., with the approval of the bureau, dated September 29, 1877.

Boiler bracing.

Four braces were removed from each of the wings, and six from each of the central boilers, on account of their proximity to the superheating steam-pipes, and were substituted by others, as shown in the tracing No. 30; this change was approved by the bureau October 7, 1878.

Auxiliary boilers.

The abandonment of the auxiliary boilers and the substitution thereof by connecting the two after main boilers so that either can be used separately for the purpose of distilling, ventilating, working turrets, steam-pumps, steam-steering, and anchor-hoisting engines, also the air and circulating pumps, was approved by the bureau October 7, 1878.

High-pressure piston-springs.

The elliptic springs in the high-pressure pistons were replaced by springs, with the approval of the bureau, dated September 29, 1877. (See tracing No. 31.)

Piston-rings for air-pump.

The bureau directed that the contractor furnish composition-rings for the air-pump piston, to be kept for use, in case the cast-iron ones were found not to answer the purpose designed, September 29, 1877.

Steam-pumps.

The changing of the four No. 6 steam-pumps for two No. 7 and two No. 9 Blake pumps for boiler feed, fire, and bilge, was approved by the bureau October 7, 1878.

Tinning steam-pipes.

The bureau directed that all steam-pipes be heavily tinned both inside and out, September 29, 1877.

Blowers and blowing-engines.

Blowers and blowing-engines were supplied to the engine compartment, also the enlargement of the main air duct, with the approval of the bureau, dated November 15, 1878.

Feed-pipe.

The main feed and blow pipes were changed from 3 inches to 3½ inches inside diameter, by direction of the bureau, dated April 18, 1877.

Ash-hoister.

The furnishing of an ash-hoister was approved by the bureau October 7, 1878. (See tracing No. 32.)

Tube-plates in condenser and tube-packing.

The manner in which the packing about tube-plate is secured is shown by reference to tracing No. 33, but the authority under which the changes were made does not appear.

Alteration of pipes about armored ventilator.

The pipes as called for in the drawings from the bureau were so completed, and thus change made to admit of the blower-engines being put in upon the platform subsequently designed for their support.

Screw propellers.

The difference made in the screws was necessitated by the leaving off of the wooden sheathing originally intended for the vessel, and the change in design is shown by reference to tracings Nos. 27 and 28.

Auxiliary air-pump engine.

The placing of an auxiliary cylinder upon the air-pump engine was recommended by a board of officers, who made a test of the machinery, in the report of May 15, 1879, and the detail drawings of said changes, or rather additions, were received from the bureau and executed accordingly.

The changes consisted of a cylinder 8 inches diameter by 26 inches stroke, secured to the coal-bunker bulkhead and attached to the forward crank-pin of the upright or crosshead engine. These bulkheads were strengthened in order to sustain this additional weight and strain by heavy wrought-iron gusset plates to the main deck and hull framing.

A larger and heavier counterbalance of wrought-iron rings was shrunk upon the crank counterbalance wheels, and the side rods connecting the crosshead and crank-pins were fitted with the ordinary strap, gib, and key in lieu of conical ring brasses originally adopted.

Upon a subsequent trial, made on August 5, 1879, the above changes

greatly added to both the efficiency and smooth working of the air-pump engine.

Owing to the limited space between the cylinders and beams, the ordinary oil-cups were removed, and forcing-pumps and oil reservoirs fitted to the cylinders and steam-chest.

The oil-cups of the main crank shaft, and also those of the crank-pins, were entirely changed and enlarged, in order to permit the use of a different engine lubricant.

The oil-cups shown in tracings Nos. 34 and 35 are for supplying the journals in the shaft alleys. A cam on the shaft moves the lever, which by a pawl and suitable gearing, as shown, causes the piston to be forced down; from the outlet as many pipes as desired are led to the various journals, the supply at each being controlled by a globe valve.

When the piston has reached the bottom of the cylinder, it is brought back by the hand-wheel on opposite end of driving shaft to the cam lever, the space above the piston being filled with oil, and the communication between its top and bottom, opened by the spindle, leading through the hollow piston-rod.

Weights of the engines of the United States iron-clad double-turret monitor Miantonomah, taken where obtainable from the actual weights as constructed, and in other details the estimated finished weights.

	Steel.	Wrought iron.	Cast iron.	Composition.
	Pounds.	Pounds.	Pounds.	Pounds.
Engine-keelsons, including angle iron and rivets		12,133		
Holding-down bolts and nuts and washers		576		
Two main-condenser chests			37,300	
Four condenser-bonnets			4,420	
Four condenser man-hole plates			690	
Four condenser tube-sheets			2,481	
Condenser-tubes (3476), $\frac{3}{4}$ diameter				9,438
Bolts and nuts for condenser		345		
Four outboard main-frames			15,748	
Two inboard main-frames			12,125	
Four outboard brackets supporting cylinders			5,690	
Two inboard brackets supporting cylinders			4,690	
Eight main slides			3,990	
Twelve check pieces for main pillow-blocks			784	
Eight pillow-block binders		2,426		
Twenty-four main-pillow block-bolts and nuts		1,770		
Six sets of crank-shaft brasses				3,281
Four main-frame tie-rods		1,858		
Sixteen hook-bolts and nuts for main-frames		250		
Four tie-bolts and nuts for main-frames		226		
One plate-washer for supporting reversing engines		188		
Four keys for tie-rods	92			
Bolts and nuts (360) for main-frames		874		
Two high-pressure cylinders			27,764	
Two high-pressure cylinder-linings			3,422	
Two high-pressure cylinder-covers			3,950	
Two high-pressure cylinder man-hole plates			220	
Four high-pressure cylinder valve-seats			516	
Bolts and nuts for high-pressure cylinder		126		
Two low-pressure cylinders			27,313	
Two low-pressure cylinder-linings			5,574	
Two low-pressure cylinder-covers			3,848	
Four low-pressure cylinder cover man-hole plates			440	
Two low-pressure cylinder valve-seats			968	
Bolts and nuts for low-pressure cylinders		178		
Two high-pressure valve-chests			6,128	
Two high-pressure valve-chest bonnets			2,994	
Bolts and nuts for high-pressure valve-chests		138		
Two low-pressure valve-chests			6,840	
Two low-pressure valve-chest bonnets			2,896	
Bolts and nuts for low-pressure valve-chests		136		
Two high-pressure pistons				1,417
Two high-pressure piston-followers				435
Two high-pressure piston-rod nuts				87
Sixteen high-pressure follower-bolts		45		
Two sets of high-pressure piston-rings			450	
Two sets of high-pressure piston-springs	54			

Weights of the engines of the Miantonomoh, &c.—Continued.

	Steel.	Wrought iron.	Cast iron.	Composition.
	Pounds.	Pounds.	Pounds.	Pounds.
Two high-pressure piston-chock pieces				101
Two low-pressure pistons				2,464
Two low-pressure piston-followers				717
Four low-pressure piston-rod nuts				137
Twenty-four low-pressure follower-bolts		68		
Two sets of low-pressure piston-rings			696	
Two sets of low-pressure piston-springs	80			150
Two low-pressure piston-chock pieces				
Two high-pressure main-valves			2,399	
Two sets of high-pressure cut-off valves and frames				680
Two nuts for high-pressure valve-stem				38
Four nuts for high-pressure cut-off valve stems				57
Two low-pressure main-valves			2,609	
Two sets of low-pressure cut-off valves and frames				579
Two nuts for low-pressure valve-stems				38
Four nuts for low-pressure cut-off valve-stems				56
Two high-pressure valve-stems	278			
Two high-pressure valve-stem sliding-bars		249		
Two low-pressure valve-stems	278			
Two low-pressure valve-stem sliding-bars		249		
Two high-pressure cut-off valve-stems	156			
Two high-pressure cut-off valve-stem bushes				13
Two high-pressure cut-off valve-stem sliding-bars		110		
Two low-pressure cut-off valve-stems	156			
Two low-pressure cut-off valve-stem bushes				13
Two low-pressure cut-off valve-stem sliding-bars		110		
Two high-pressure valve-stem stuffing-boxes and glands				63
Two high-pressure cut-off valve-stem stuffing-boxes and glands				55
Two low-pressure valve-stem stuffing-boxes and glands				63
Two low-pressure cut-off valve-stem stuffing-boxes and glands				55
Two high-pressure piston-rod stuffing-boxes and glands				270
Four low-pressure piston-rod stuffing-boxes and glands				494
Bolts and nuts (102) for piston-rod and valve-stem stuffing-boxes		108		
Four brackets for valve-stem guides			1,036	
Four boxes for cut-off gear				300
Four plates for cut-off gear				136
Sixteen gibs for main and cut-off valve-stem sliding-bars				161
Eight wheels and pinions for cut-off gear				151
Twelve caps for valve-gear		583		
Four brackets for cut-off gear		31		
Bolts and nuts for valve-gear		84		
Twelve eccentrics			3,276	
Twelve sets of eccentric-straps				3,212
Eight eccentric-rods		802		
Four cut-off eccentric-rods		337		
Thirty-two rings for eccentric-rods				47
Four links		440		
Four link-blocks				121
Bolts and nuts (84) for valve-gear		339		
Two high-pressure piston-rods and nuts		1,804		
Four low-pressure piston-rods and nuts		2,112		
Two high-pressure crossheads		693		
Two low-pressure crossheads		742		
Four sets of crosshead-brasses				394
Two high-pressure connecting-rods, straps, gibs, and keys		2,987		
Two low-pressure connecting-rods, straps, gibs, and keys		2,848		
Four sets of crank-pin brasses				985
Eight sets of connecting-rod brasses (forked end)				334
Two crank-shafts		27,842		
Two inboard sections of line-shafting		11,043		
Two thrust sections of line-shafting		11,739		
Two outboard sections of line-shafting		21,729		
Two composition-sleeves for outboard sections of line-shafting				4,112
Twelve bolts and nuts for line-shafting		401		
Ten keys for line-shafting	473			
Two couplings for line-shafting			1,430	
Two sets of clutch-couplings			7,618	
Ten bands for clutch-couplings		1,477		
Thirty-two facing-pieces for clutch-couplings				557
Two sets of clutch-coupling gear		361		
Bushings and nuts for clutch-couplings gear				131
Two thrust pillow blocks and binders		3,770		
Twenty-two thrust-rings				1,210
Four thrust bolts and nuts		1,330		
Four line-shaft pillow-blocks and binders			2,648	
Four pedestals for line-shaft pillow-blocks			2,608	
Four frames for pedestals of line-shaft pillow-blocks		3,074		
Two frames for thrust pillow-blocks		1,401		
Twelve keys for thrust and line-shaft pillow-blocks	125			

Weights of the engines of the Miantonomoh, &c.—Continued.

	Steel.	Wrought iron.	Cast iron.	Composition.
	Pounds.	Pounds.	Pounds.	Pounds.
Four line-shaft pillow-block brasses				544
Bolts and nuts (56) for line-shaft pillow-blocks		701		
Four thimbles for thrust-bolts			45	
Two shaft-hanger fastenings		7,838		
Two bushings for shaft-hangers				803
Two screw-propellers			16,438	
Two caps for screw-propellers			152	
Twelve bolts for propeller-caps		21		
Two stern-pipes		5,480		
Two flanges for stern-pipes		1,060		
Four butt-straps for stern-pipes		450		
Two inner bushings for stern-bearing				402
Two outer bushings for stern-bearing				402
Twelve rings for bushings supports		874		
Eight bolts for stern-bearings				14
Two stuffing-boxes for stern-bearings				724
Two stuffing-box glands for stern-bearings				230
Two sets of bolts for stuffing-boxes				63
Two reversing-cylinders, with covers, pistons, cocks, and glands				615
Two hand-wheels for reversing engines			103	
Two yokes for reversing engines			133	
Two bushings for yokes				19
Two screws for reversing engines		29		
Two sets of packing-rings for reversing engines			16	
Bolts and nuts for reversing engines		68		
Two piston-rods complete for reversing engines		139		
Four columns for reversing engines		84		
Two reversing-shafts		761		
Six reversing-shaft brasses				99
Six arms for reversing-shafts		355		
Four suspending-rods		104		
Two bushings for reversing-gear				15
Upper engine-room flooring			8,892	
Flanges and brackets for engine-room flooring			202	
Angle and T-iron for engine-room flooring		3,039		
Straps and bolts for engine-room flooring		307		
Four columns for cut-off gear			220	
Four shafts for cut-off gear		92		
Four wheels and pinions for cut-off gear				91
Eight relief-valves				164
Eight springs for relief-valves				8
Eight stems for relief-valves		48		
Eight guides for relief-valve-stems				18
Eight arms for relief-valves				38
Eight passover-valves				107
Eight guards for passover-valves				26
Four stems for passover valves		61		
Bolts and nuts (24) for hand-gear		15		
Two throttle-valves and chambers				224
Two throttle-valve spindles		15		
Two main-stop valves				143
Two stems and four stud-bolts for main-stop valves		38		
Two bonnets for main-stop valves			142	
Two charging-valves and seats, yokes, hand-wheels and glands				29
Two bonnets for charging valves			32	
Two stems, bolts, and nuts for charging-valves		9		
Two safety-valves for receivers				75
Two levers, stems, bolts, and nuts for safety-valves of receivers		11		
Eight valves for closing openings in low-pressure cylinders				84
Eight stems for same		12		
Bolts and nuts for main-stop and throttle-valves		76		
Two sets of throttle-valve gear		60		
Two sets of relief-valve gear		208		
Two sets of passover-valve gear		134		
Two quadrants for hand-gear		82		
Bushings for hand gear				58
Six bolts for hand-gear		12		
Two sets of indicator-gear		66		
Two face-plates for gauges				92
Four brackets for supporting face-plates				52
Details of two sets of counter-gear		39		
Four steam-gauges				52
Two vacuum gauges				26
Two counters				32
One engine-room clock				16
Two engine-room gongs				80
Two sets of bell-pull gear				58
Lower engine-room floor-plates			4,085	

Weights of the engines of the Miantonomoh, &c.—Continued.

	Steel.	Wrought iron.	Cast iron.	Composition.
	Pounds.	Pounds.	Pounds.	Pounds.
Angle-iron for lower engine-room flooring.....		3,370		
Straps, bolts, &c., for lower engine-room flooring.....		769	178	
Chairs for supporting lower engine-room flooring.....			656	
Engine-room ladders.....			887	
Hand-rails, &c.....				327
One salt feed-cock.....		2		19
Two bilge-injection chambers and bonnets.....			208	
Two valves, seats, yokes, wheels, and glands for bilge-injections.....				31
Two stems, bolts, and nuts for bilge-injections.....		34		
One main injection chamber and bonnet.....			1,080	
One valve and valve-seat, yoke, wheel, and gland for main-injection-valve.....				163
One valve-stem, bolts and nuts for main injection-valve.....		80		
One outboard delivery-valve chamber and bonnet.....			1,030	
One outboard delivery-valve and seat, flange, and gland.....				114
One lever, stem, bolts and nuts for outboard delivery-valve.....		121		
Two bilge-delivery check-valves.....				140
Bolts and nuts for delivery check-valves.....		25		
One set of oil cups.....				215
One Selden's filter.....		208	3,340	76
After bilge-box, strainer, and valve.....		18	380	20
Drip-pans, eccentrics, piston-rod, stems &c.....				125
Brass bands about pipes, brackets, &c.....				140

Weights in detail of air and circulating-pumps, &c.

One air-pump cylinder and chest.....			8,160	
One air-pump cover.....			183	
One frame for air-pump valves.....			491	
One gland for air-pump rod.....				15
Bonnets for air-pump cylinder-chest.....			575	
One air-pump lining.....				225
One air-pump piston.....				174
One air-pump piston-follower.....				54
One air-pump piston-rod.....		124		
One casing for air-pump piston-rod.....				15
One set of packing-rings for air-pump piston.....			54	
One set of follower-bolts for air-pump piston.....		8		
Four valve-seats and three guards for air-pump.....				331
Bolts, nuts, and washers for air-pump cylinder.....		39		80
One steam-cylinder and cylinder-cover for air-pump.....			2,178	
One steam-chest.....			526	
One steam-chest bonnet.....			232	
One steam-cylinder piston.....				139
One steam-cylinder piston-follower.....				33
One set of steam-piston-packing-rings.....			33	
One set of follower-bolts for steam-piston.....		6		
Two keys for steam-cylinder piston-rods.....		24		
Two piston-rods and nut for steam-cylinder.....		108		
One main crosshead.....		211		
One crosshead for main valve.....		31		
One crosshead for cut-off valve.....		23		
Two valve-stems and nuts.....		28		
One valve-stem and nuts for cut-off.....		12		
Two sets of crank-shaft brasses, and glands for piston-rods and valve-stems.....				143
Two air-pump engine frames.....			1,215	
One main valve for air-pump engine.....			140	
Two cut-off valves for air-pump engine.....				40
Four guide-rods and nuts for cut-off valves.....		8		
Two nuts for main and cut-off valves.....				3
Bolts, nuts, and keys, for air-pump engine.....		68		
Two sets of crosshead gibs.....				40
One fly-wheel shaft.....		152		
Two fly-wheels.....		787	1,304	
Two crank-pins.....		25		
Two eccentrics.....			76	
Two eccentric-rods.....		24		
Two eccentric-straps.....				101
Four side rods for main and cut-off valves.....		104		
Bolts and nuts for valve-gear.....		19		
Two rock-shafts.....	76			
Four rock-shaft arms.....		47		
Two connecting-rods.....		296		
Eight rings for connecting-rods.....				15
Two plungers for feed-pumps.....				141
Two sets of feed-pump valves, valve-seats, and nuts.....				110
Two bushes and glands for feed-pump plungers.....				83
Two regulating-valves for feed-pumps.....				76

Weights of the engines of the Miantonomoh, &c.—Continued.

	Steel.	Wrought iron.	Cast iron.	Composition.
	Pounds.	Pounds.	Pounds.	Pounds.
One relief-valve for hot-well				162
Four bonnets for feed-pump valves			129	
One safety feed-valve				135
One stop-valve for air-pump engine				97
Two stop-valves for feed-pumps				59
Bolts and nuts		147		
One connecting-pipe from condenser to air-pump			3,945	
One chamber for distilling apparatus			961	
One coupling and aerator				25
One filter for distilling apparatus		72		
One auxiliary condenser-shell			4,475	
Two bonnets for auxiliary condenser			1,600	
Two tube-sheets for auxiliary condenser			807	
Tubes for auxiliary condenser				1,392
Bolts and nuts for auxiliary condenser		182		
Two stop-valves for auxiliary engines		48		306
Two circulating-engines, complete	7	1,023	5,989	251
Two circulating-pumps, complete		89	3,199	100
Five indicator-cocks				30

SPARE MACHINERY.

One seat with guards, bolts, &c., for receiving and delivery-valves of air-pump				177
Four guards with bolts, &c., for feed and bilge pumps				110
One set of follower-bolts for each piston		118		
One set of follower-bolts for air-pump		8		
One set of crank-shaft brasses				3,281
One set of brasses for each crank-pin				965
One set of brasses for thrust-bearings				1,210
One set of brasses for line-shaft pillow-blocks				544
One set of brasses for crosshead journals				324
Two boxes for links				60
Two sets crosshead gibs				197
Two crank-pin oil-cups				20
Three main-journal oil-cups				15
Two hundred condenser-tubes				550
One hundred boiler-tubes				4,886

MISCELLANEOUS PARTS.

Engine-room steam and fire pumps	200	2,300	1,200
Engine-room feed-pumps	60	1,806	200
Distiller circulating-pump	30	500	150
Weight of after ventilators	4,282		222
Weight of central ventilators	3,442		120
Weight of forward ventilators	4,076		395
Weight of three oil-tanks, &c.	4,104	146	30
Weight of one tallow-tank	155		
Weight of hose-couplings, cocks			132
Lignum-vitæ, stern-bearings, &c. (wood)			324
Rubber valves and spare (gum)			86
Rubber valves for steam-pump (gum)			232
Rubber on joints, &c. (gum)			350
Lining for engine-beds, &c.	481		
Shaft-alleys complete, doors, &c.	20,411		
Store-rooms, doors, &c.	12,447		
Tools, wrenches, eye-bolts, &c.	452		
Fitting and lagging of cylinders and valve-chests (wood, &c.)			505

SUMMARY OF WEIGHTS OF ENGINES.

	Pounds.
Wrought iron	198,466
Cast iron	287,793
Steel	1,775
Composition	58,734
Copper pipes	21,574
Globe-valves	1,970
Miscellaneous (wood, gum, &c.)	1,397
Total	571,709

Weights of steam-piping and globe-valves connected with machinery of United States iron-clad Miantonomoh.

[NOTE.—Since the following weights were computed various changes have been made in the piping, changing direction but without materially altering the general result, inclusive of flanges, couplings, &c.]

	Pounds.
Main steam-pipes.....	3,501
Main injection-pipes.....	736
Main feed and blow-pipes.....	1,633
Main circulating-pipes.....	378
Main outboard delivery-pipes.....	716
Main pipes to steam-drums.....	742
Circulating-engine pipes.....	217
Air-pump engine pipes.....	140
Air-pump engine pipes.....	247
Air-pump engine branches.....	40
Air-pump chamber and pipe.....	151
Air-pump delivery-pipe.....	126
Air-pump connecting-pipe.....	177
Condenser overflow-pipe.....	343
Discharge from steam-pump.....	315
Suction to steam-pump.....	163
Condenser drain-pipes.....	106
Steam-pump suctions.....	901
Steam-pump discharges.....	717
Pipe between condensers.....	100
Escape-pipes.....	853
Escape-pipes, internal.....	131
Feed-pipe branches.....	169
Surface blow-pipes.....	346
Water-gauge pipes, cocks, &c.....	415
Waste-pipes, to relief.....	233
Steam-gauge pipes.....	34
Salinometer-pipes.....	36
Water-pipe for journals.....	61
Cylinder-drains.....	70
Sundry drains and branches.....	181
Steam-pipe drains.....	54
Indicator-pipes.....	25
Pipes for reversing-engines.....	98
Escape-pipe from superheaters.....	114
Feed safety-pipe, &c.....	83
Drain-pipe from stuffing-boxes.....	32
Oil-pipes.....	10
Worms, distilling apparatus.....	205
Pipes, internal, stop-valves.....	301
Condenser, overflow.....	343
Drain auxiliary condenser.....	106
Suction steam-pumps.....	433
Discharge-steam pumps.....	545
Drains, air-pump.....	20
Drains, circulating-pump.....	27
Whistle-pipe.....	75
Bilge-suctions.....	98
Dry pipes, auxiliary pumps.....	71
Steam-pipes, auxiliary pumps.....	904
Donkey-pump discharge.....	545
Steam-pipe after boilers.....	1,851
Drip-pipes, steam-drums.....	228
Drip-pipes, stop-valves.....	32
Donkey-pump exhaust.....	395
Water-piping, Selden's filterer.....	59
Steam-pipes, distiller.....	89
Discharge-pipes, distiller.....	109
Bleeding-pipe to condensers.....	180
High-pressure pipe, auxiliary condenser.....	544
Relief-valve, receiver-pipes.....	20
Miscellaneous globe-valves about engines, pumps, auxiliary condenser, filter, &c.....	1,970

SUMMARY.

	Pounds.
Weight of copper pipes	21,574
Weight of globe-valves	1,970
Total	23,544

Weights of the boilers of the United States iron-clad double-turret monitor Miantonomoh, taken where obtainable from the actual weights as constructed, and in other details the estimated finished weights.

	Steel.	Wrought iron.	Cast iron.	Composition.
	Pounds.	Pounds.	Pounds.	Pounds.
Six boilers, including braces, tubes, man and hand hole plates		246,475		33,202
Four steam-drums, including braces and man-hole plates		8,046		
Eighteen furnace-fronts			5,730	
Eighteen furnace-front linings			1,368	
Eighteen furnace-doors		1,118		
Eighteen linings for furnace-doors		792		
Uptakes, uptake-doors, and mountings		17,767		
One smoke-pipe		7,426		
Smoke-pipe guys		383		
Four superheating-steam pipes		10,838		
Two elbows for superheating-steam pipes			1,246	
Two flanges for superheating-steam pipes			526	
Eighteen back-bearers and bridge-walls			7,907	
Eighteen middle-bearing bars			1,530	
Eighteen front-bearing bars			2,160	
Grate-bars (468)			20,277	
Eighteen ash-pan doors and mountings		480		
Brackets, straps, bolts, and nuts for supporting steam-drums		950		
Twelve boiler saddles, including fastenings, straps, and bolts		7,838		
Two main stop-valve chambers			1,126	
Bolts and nuts and valve-stems for main stop-valves		101		252
Valves, valve-seats, hand wheels and glands, main stop-valves				1,278
Six boiler stop-valves		217		104
Six safety-valves		312	1,074	
Eight sets of safety-valve hoisting-gear		120	600	
Six dry pipes				301
Two safety-valves for superheaters		64		161
Bolts and nuts		22		
Two stop-valves for after boilers		104	357	35
Six check-valves	9			374
Six bottom blow-valves	3			186
Six surface blow-valves	3			132
Bolts and nuts for check and blow valves		82		468
Six sets of water-gauges, complete				120
Six salinometer-pots				78
Two stop-valves for donkey-pumps, &c.			490	17
One stop-valve, main feed		4		55
Two sea-valves, complete		24	510	181
Fire-room floor-plates		5,166		
Angle-iron for floor-plates		3,027		
Chairs for fire-room floor-plates			3,614	
Straps, bolts, and nuts for fire-room floor-plates		362		
Six ash-pan gutters		2,118		
Four fire-room ladders		272		
Two water-tanks for steam-drum drip-pipes		770		
Six sets of fire-tools		2,190		

	Pounds.
Plaster-of-Paris uptakes, &c.	16,038
Fire-bricks, bridge-walls	1,943
Casing, covering, &c. (kind undetermined)	
Lead in safety-valves, &c.	2448
Rubber in joints, &c.	130

SUMMARY WEIGHTS OF BOILERS.

	Pounds.
Wrought iron	316,454
Cast iron	49,307
Composition	36,944
Lead	2,448
Steel	15
Plaster of Paris	16,038

Fire-bricks	Pounds.
Rubber	1,943
	130
Total	423,279

Weight of coal-bunker bulkheads, including doors, braces, angle-irons, &c., complete, exclusive of store-rooms and shaft-alleys..... 107,438

Miscellaneous weights of various parts of the engines and boilers not included in the original contract for the machinery of the Miantonomoh or subsequent drawings furnished by the bureau.

Name.	Steel.	Wrought iron.	Cast iron.	Composition.
	Pounds.	Pounds.	Pounds.	Pounds.
Engine-room blowers, with engines	1,040	1,913	7,617	78
Ash-hoister, pulleys, &c.		105	1,400	26
Steam windlass and gear		3,684	19,535	1,228
Steam-steering engine, Sickles	593	1,749	2,530	3,292
Steam-steering foundation for Sickles		2,484		
Steam-steering engine, Manton (exclusive of foundation)	230	2,285	11,783	136
Fourteen steam-radiators		7,390	960	100
Three traps, pipes, &c.		550	450	
Three wrecking-pumps	96	375	9,387	1,848
Auxiliary air-pump cylinder	23	150	900	50
Auxiliary air-pump brackets, &c.		827	103	
Additions air and circulating pumps	100			166
Additions coal-bunkers for air-pump		2,370		
Doors back of boilers		3,437	30	

* Gum.

SUMMARY.

Wrought iron.....	Pounds.
Cast iron.....	27,762
Composition	45,724
Steel	6,924
Gum	1,746
	280
Total.....	82,436

General summary of weights.

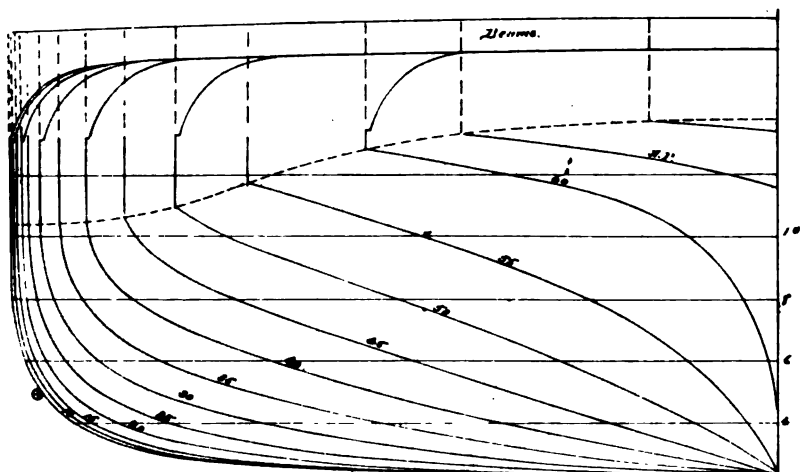
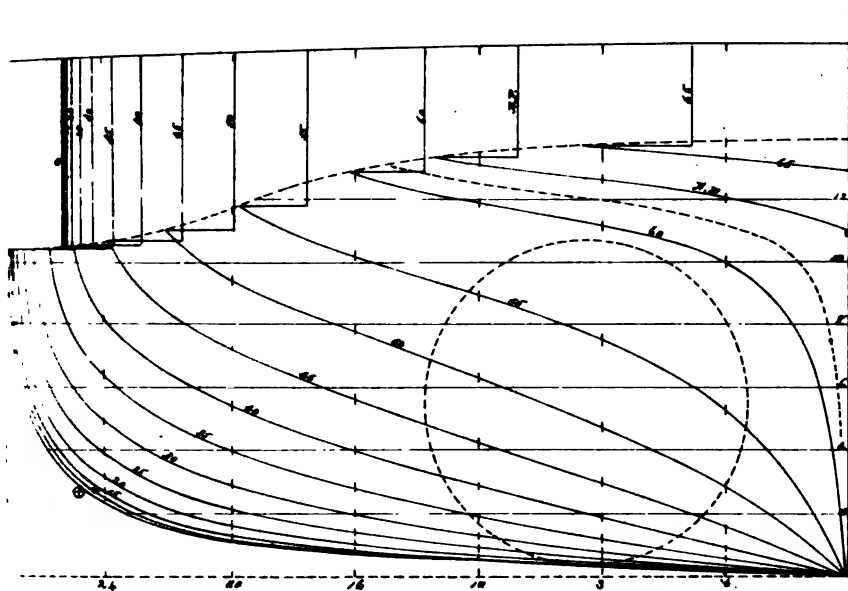
	Wrought iron.	Cast iron.	Composition.	Steel.	Various materials.
Engines as per detailed list	198,466	287,793	58,734	1,775	24,941
Boilers as per detailed list	316,454	49,307	36,944	15	20,559
Coal-bunkers complete	107,438				
Miscellaneous articles	27,762	45,724	6,924	1,746	280
Totals	650,120	382,824	102,602	3,536	45,780

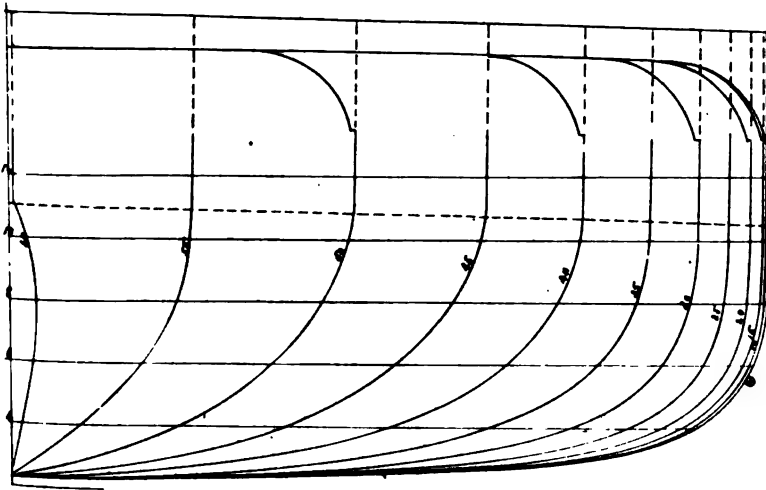
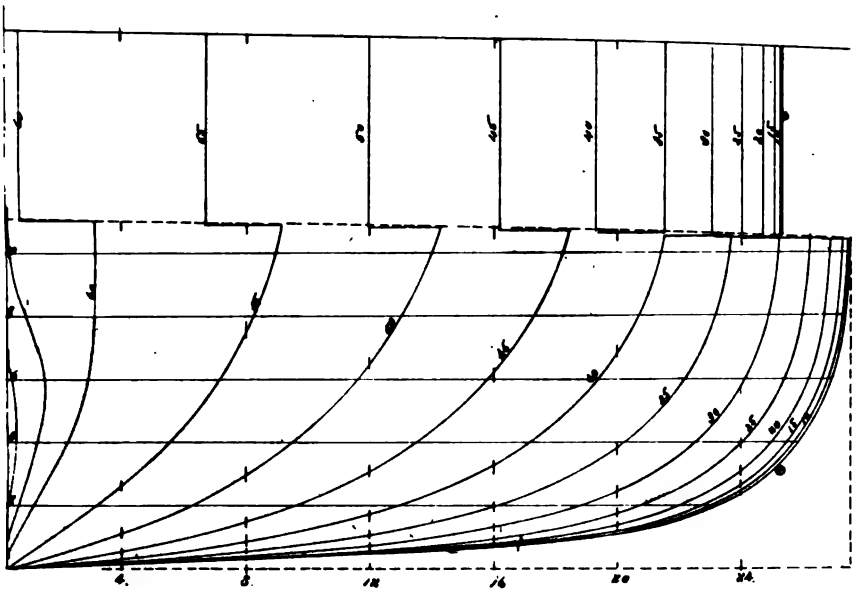
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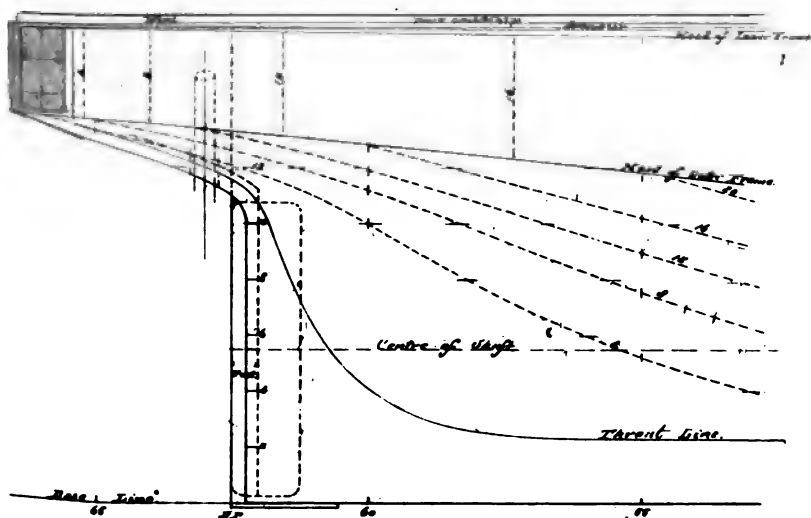
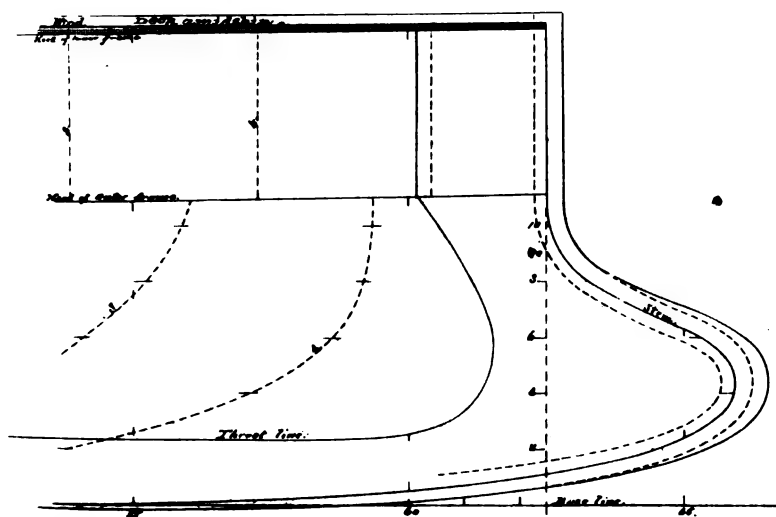
Wrought-iron	Pounds.
Cast-iron	650,120
Composition	382,824
Steel	102,602
Steel	3,536
Various materials.....	45,780
Grand total	1,184,862

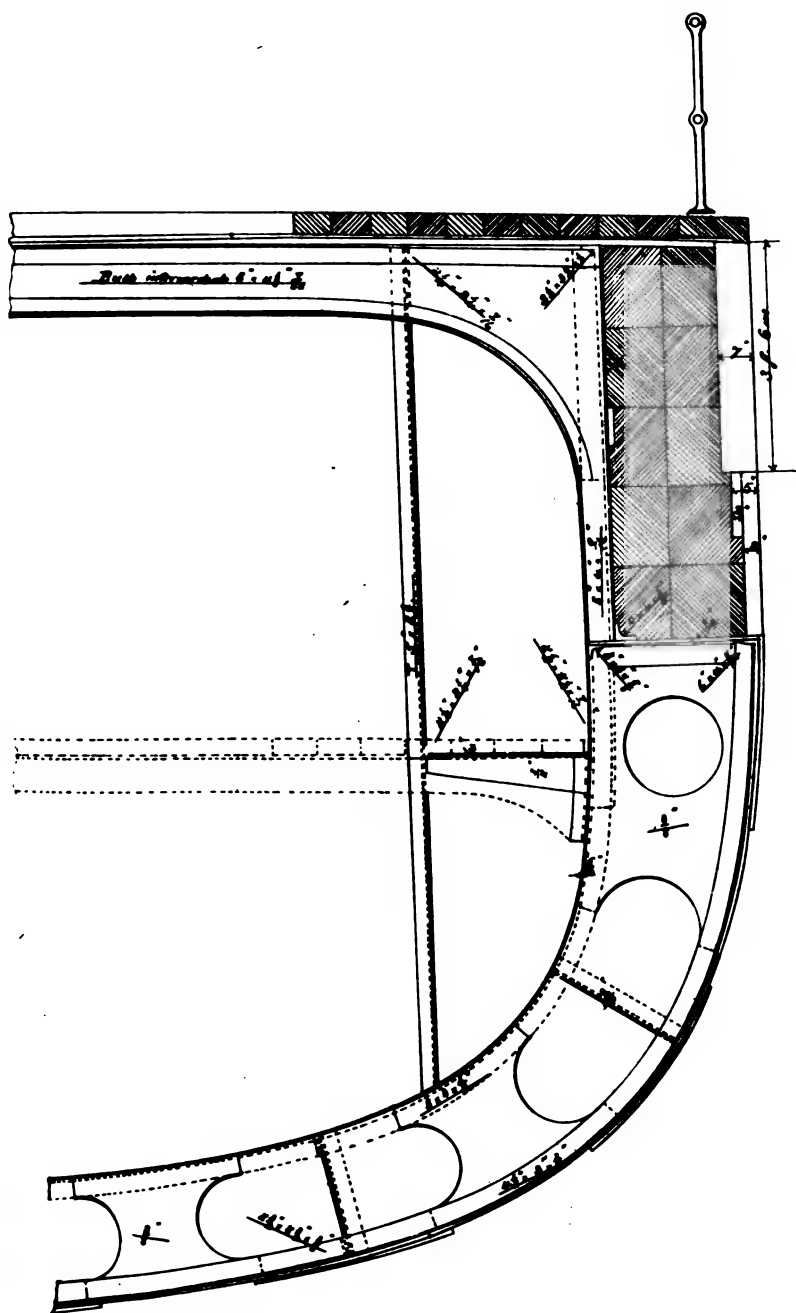
Or, expressing these weights in another manner—

Engines complete	Pounds.
Boilers complete	571,709
Coal-bunkers complete	423,279
Miscellaneous parts complete	107,438
	82,436

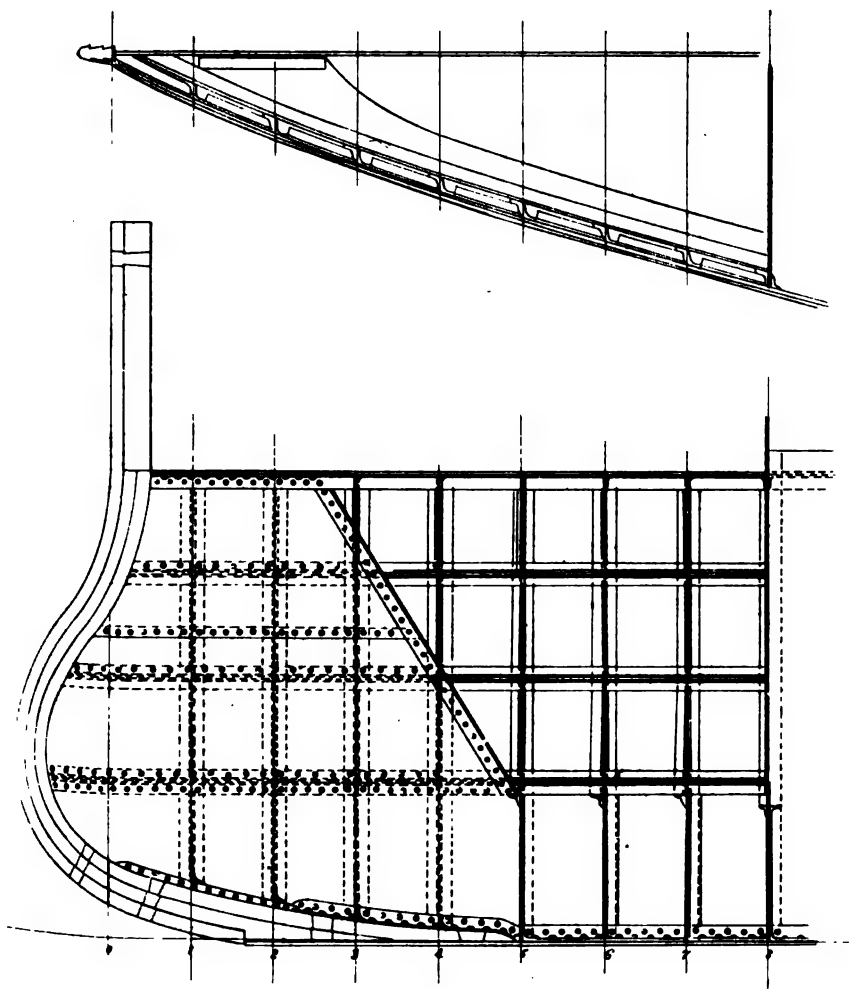


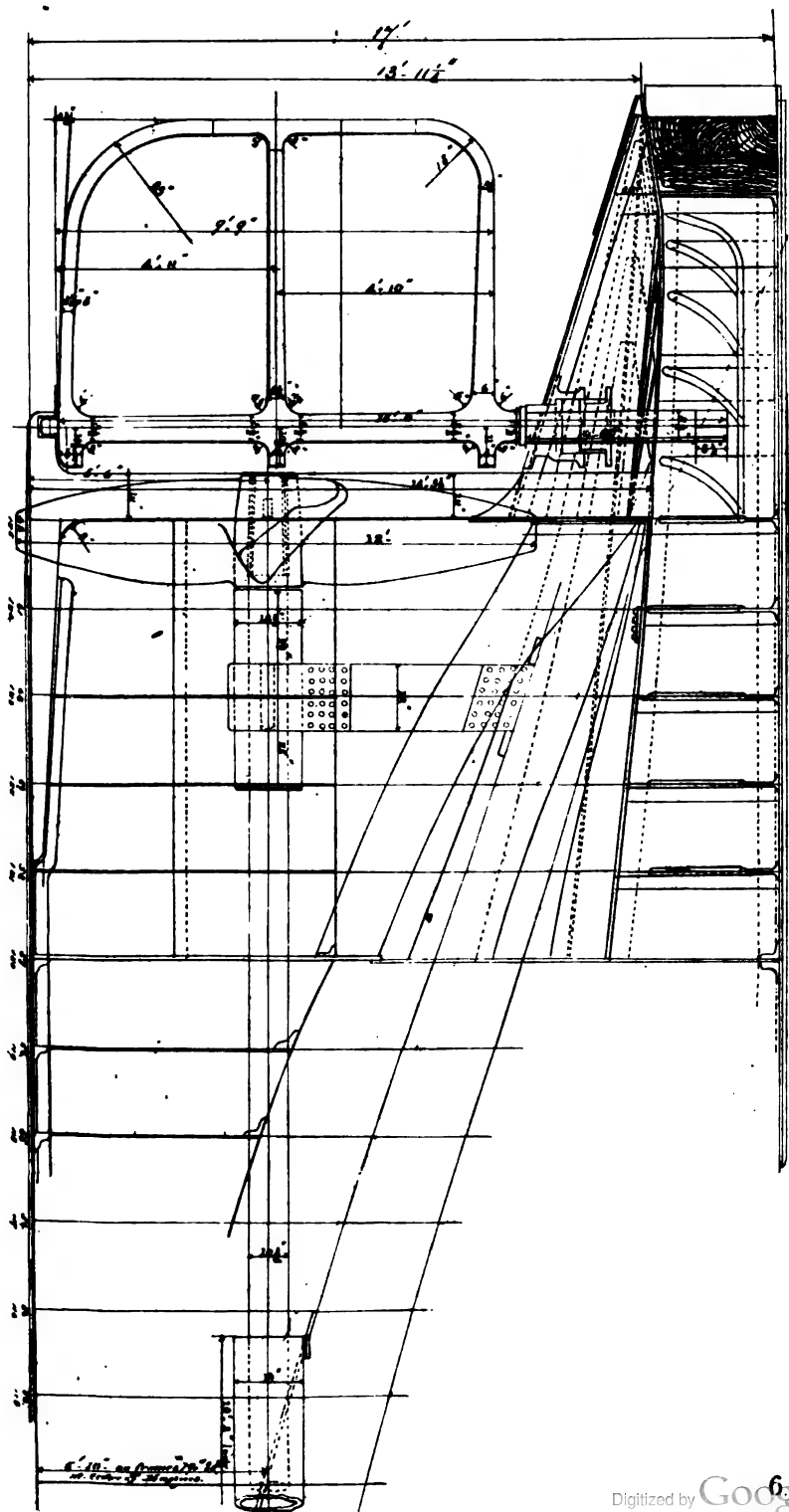


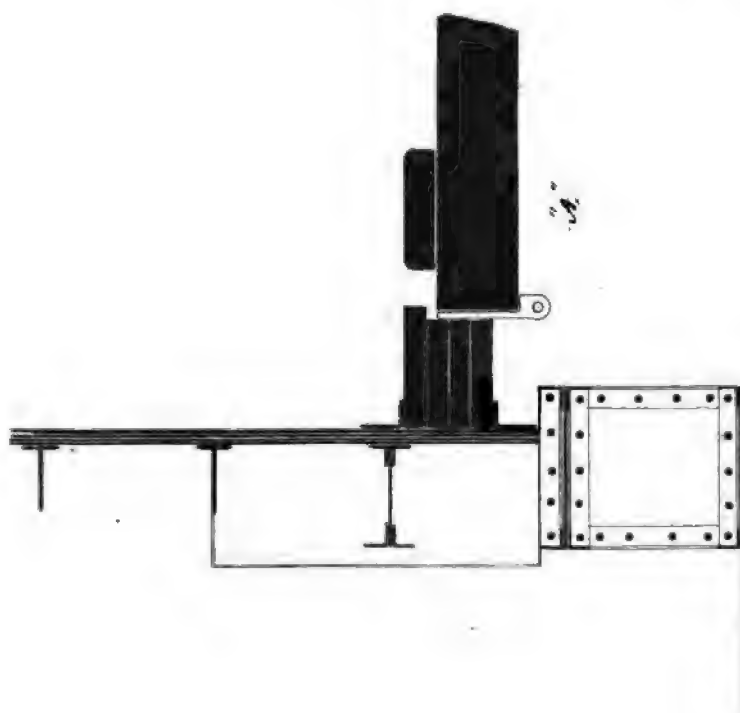
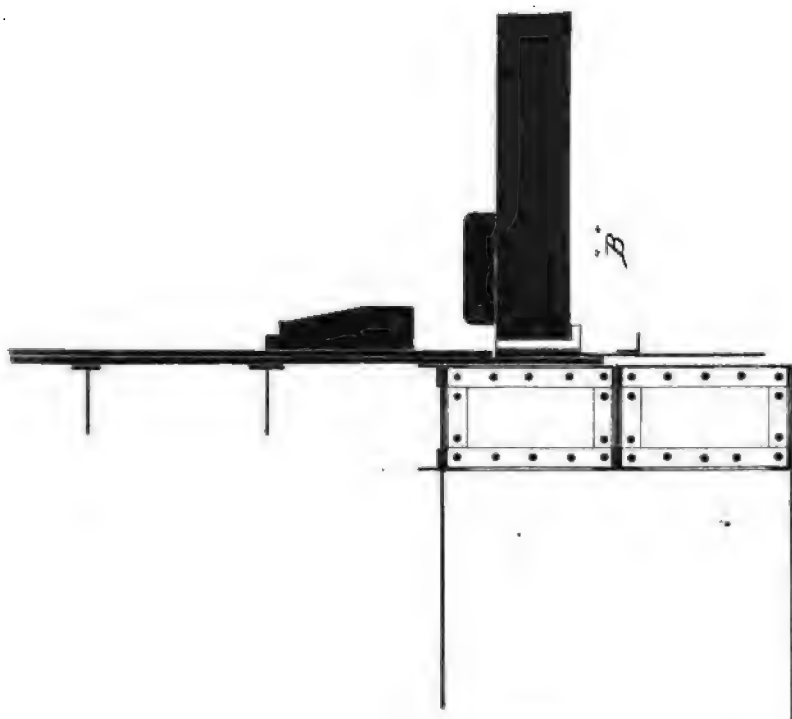


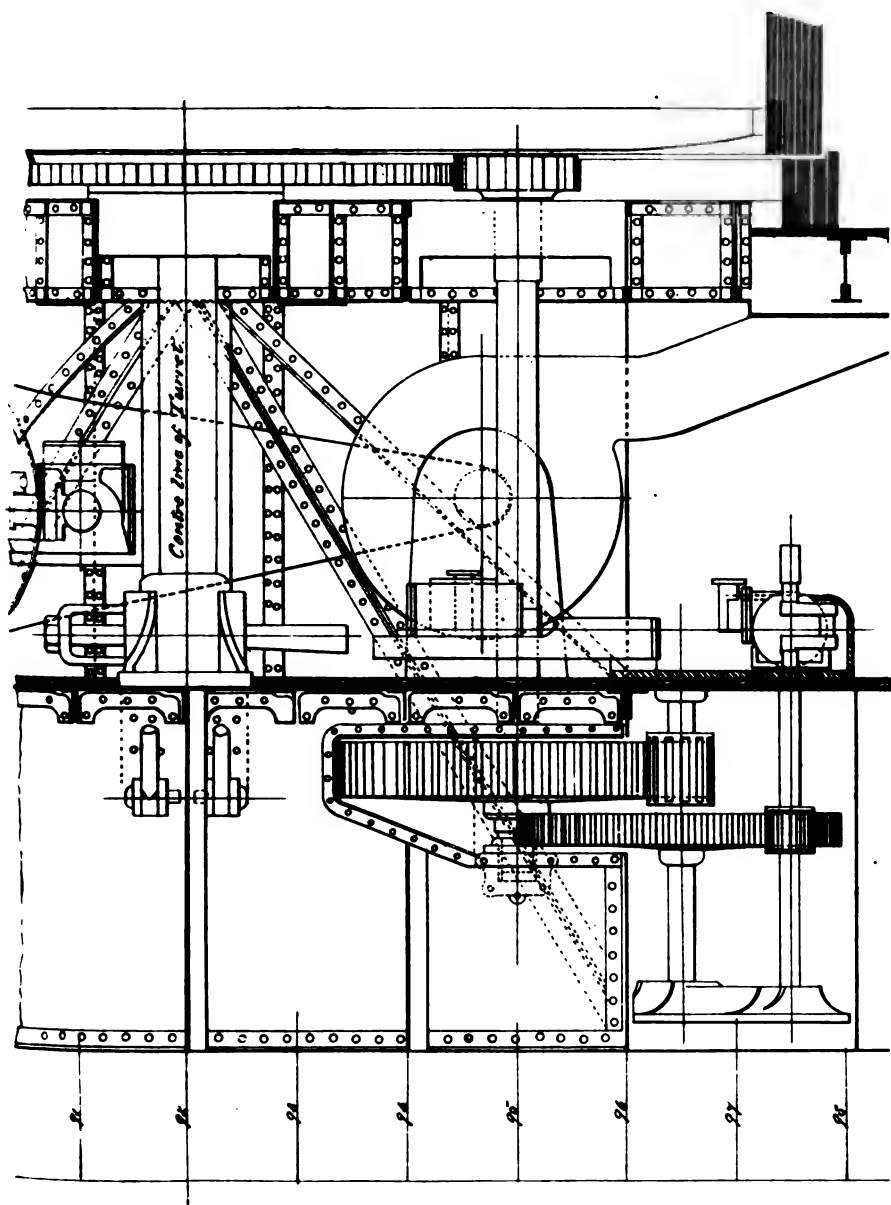


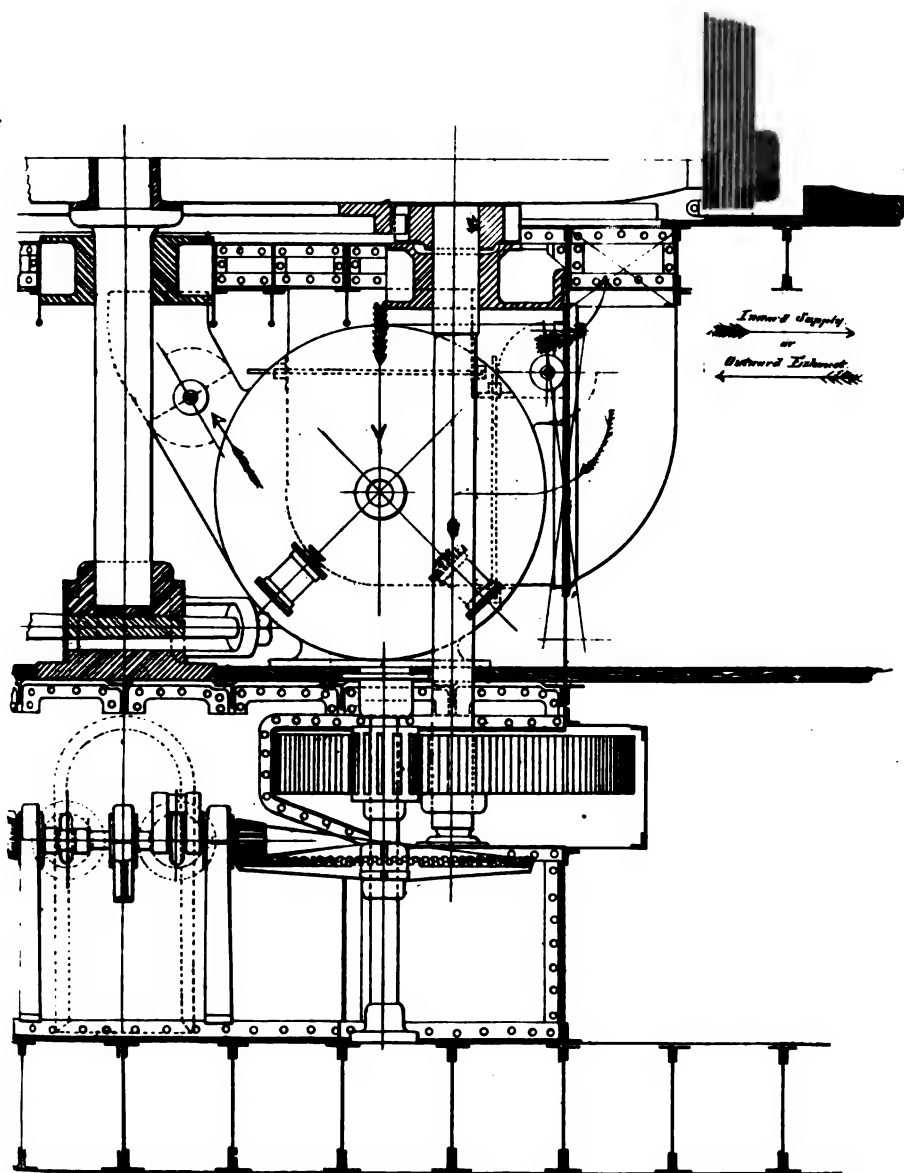
U.S. Iron Clad "Monitor"
Armor Plating at midship section.

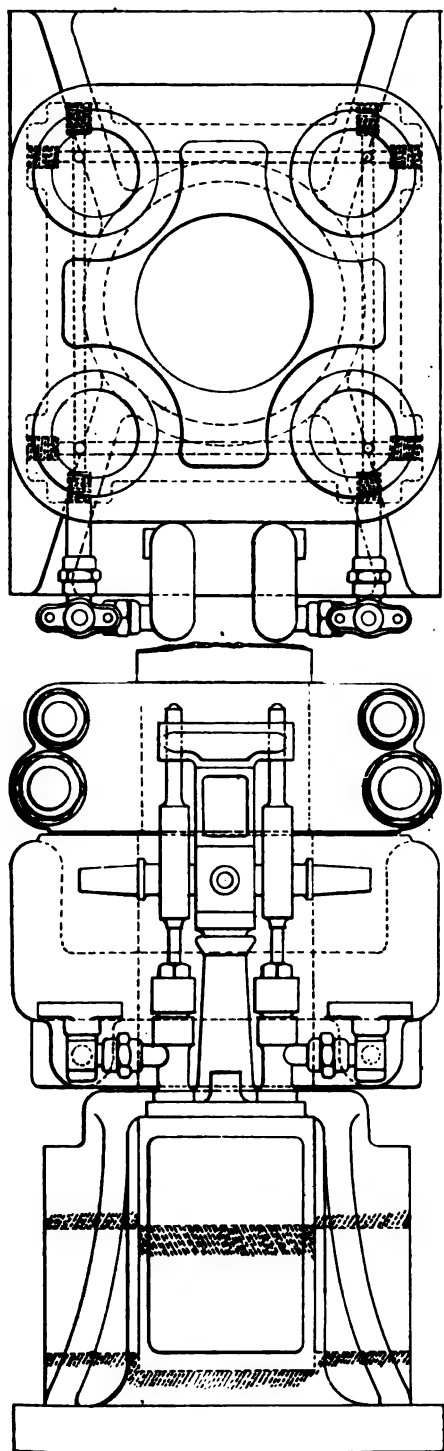




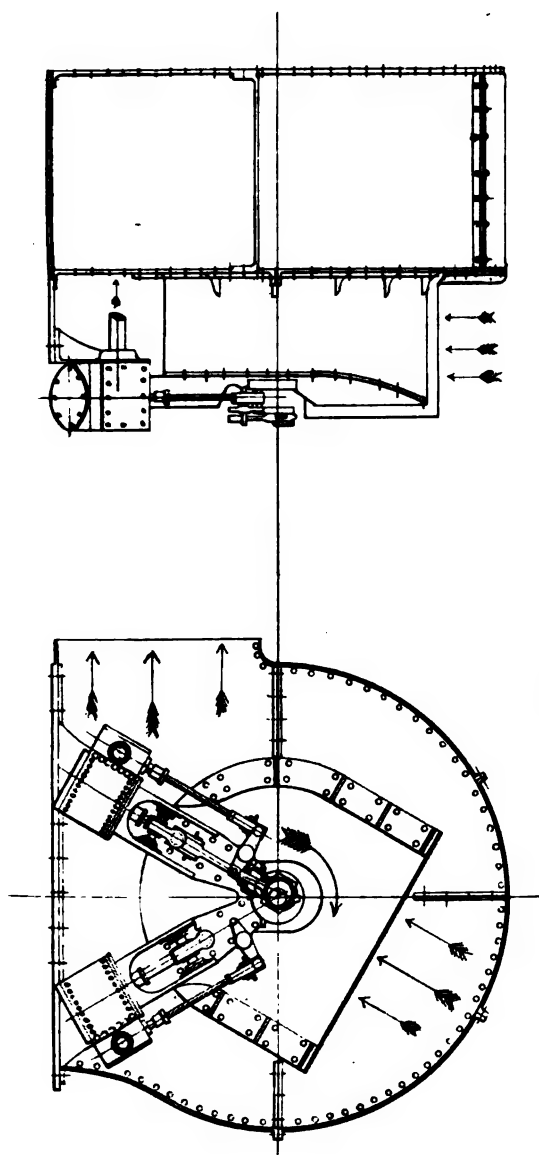


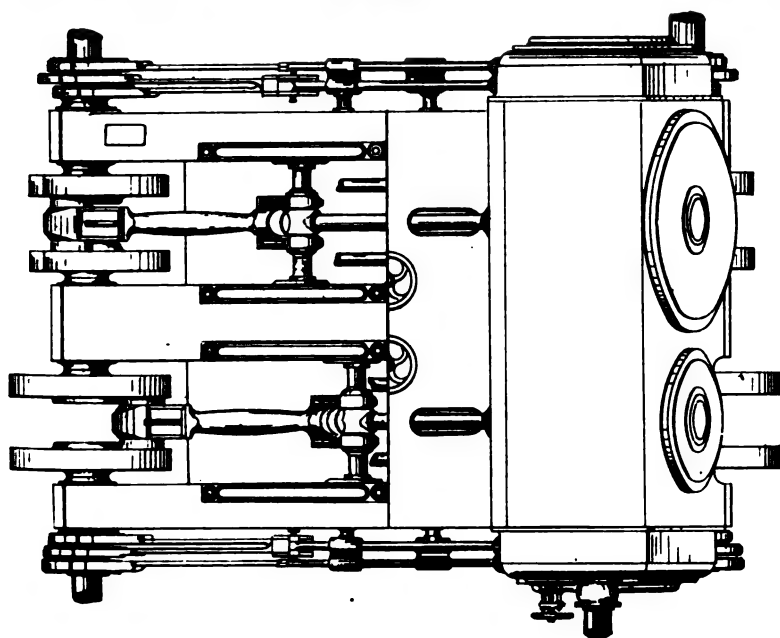
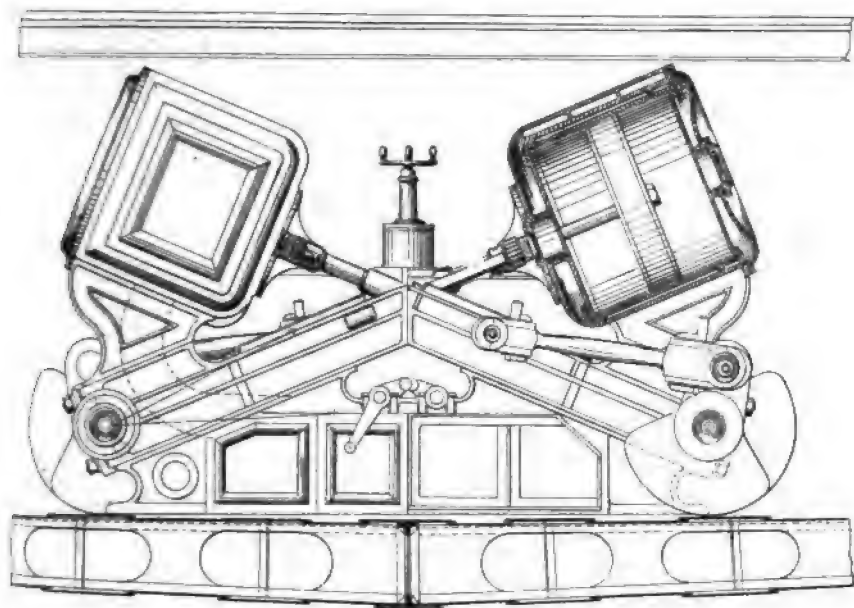




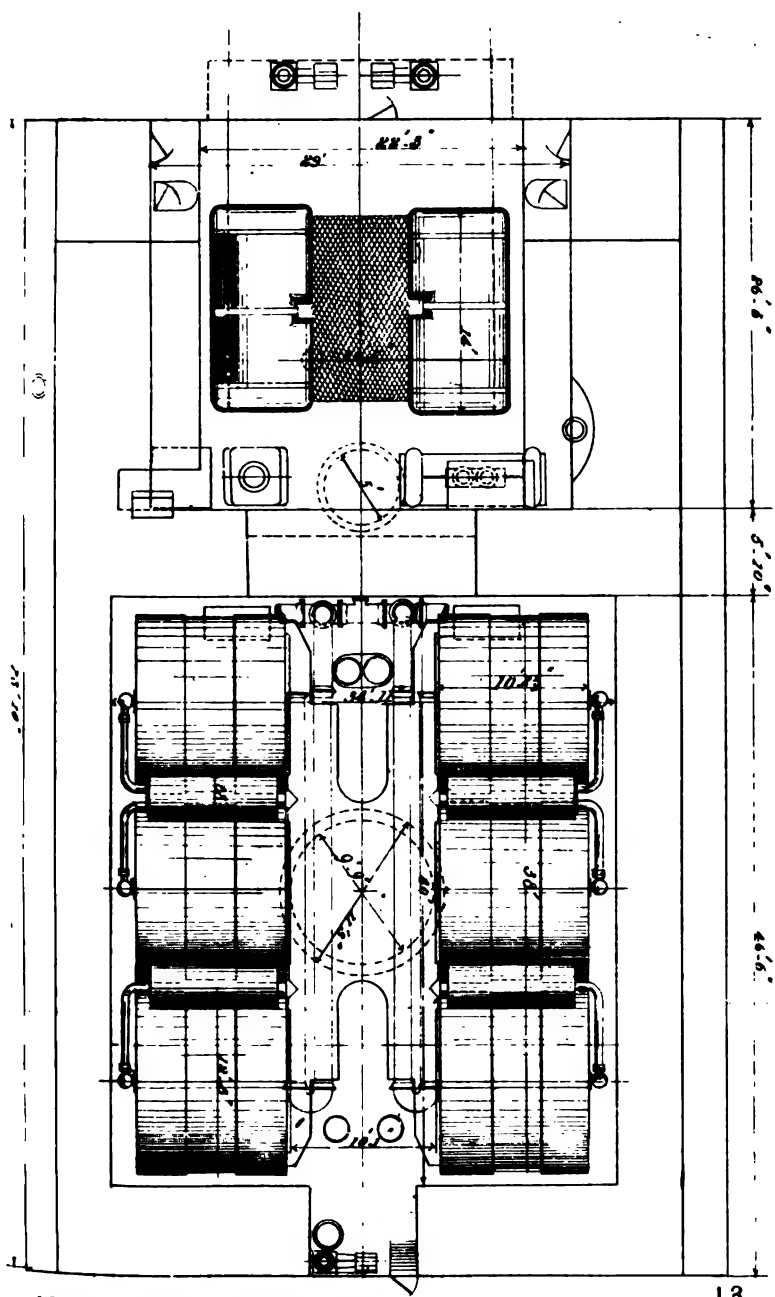


*U.S. Iron Plate Manufacturing
Four Pump Hydraulic Turbine Life*

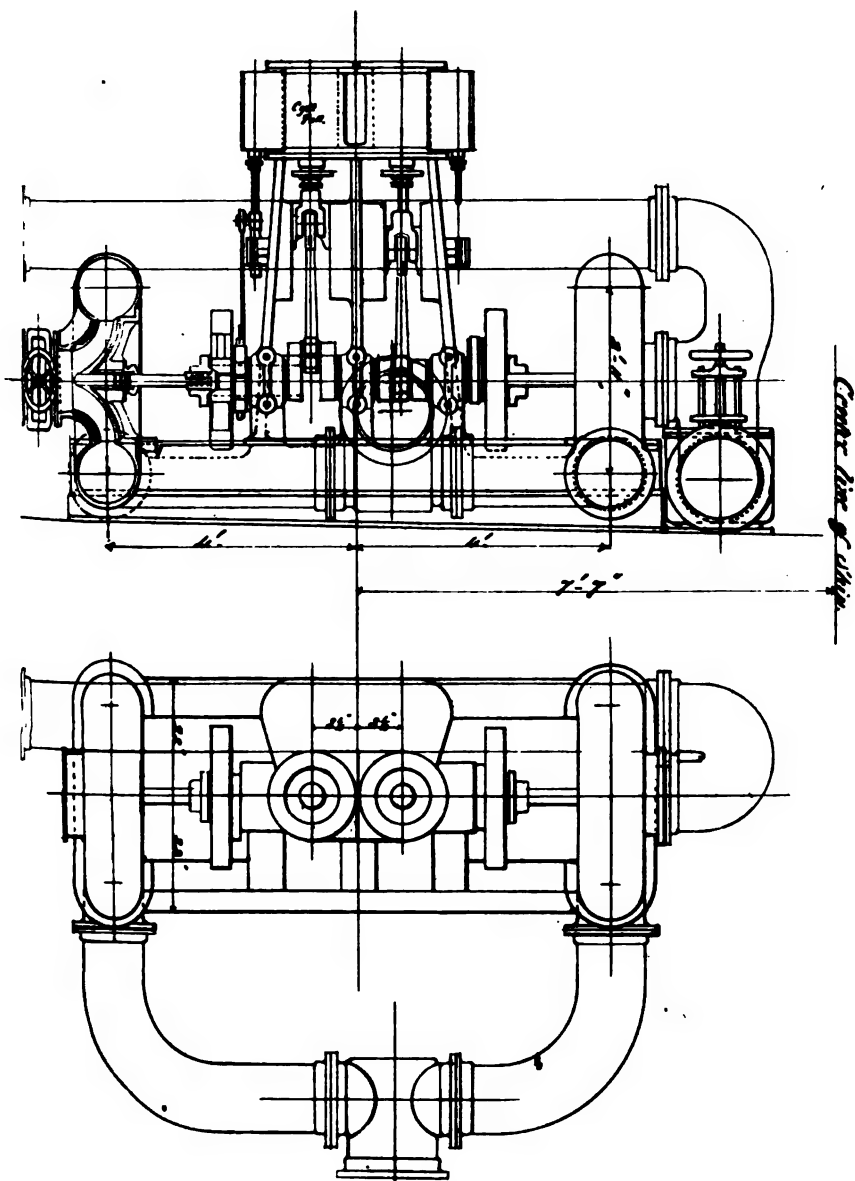




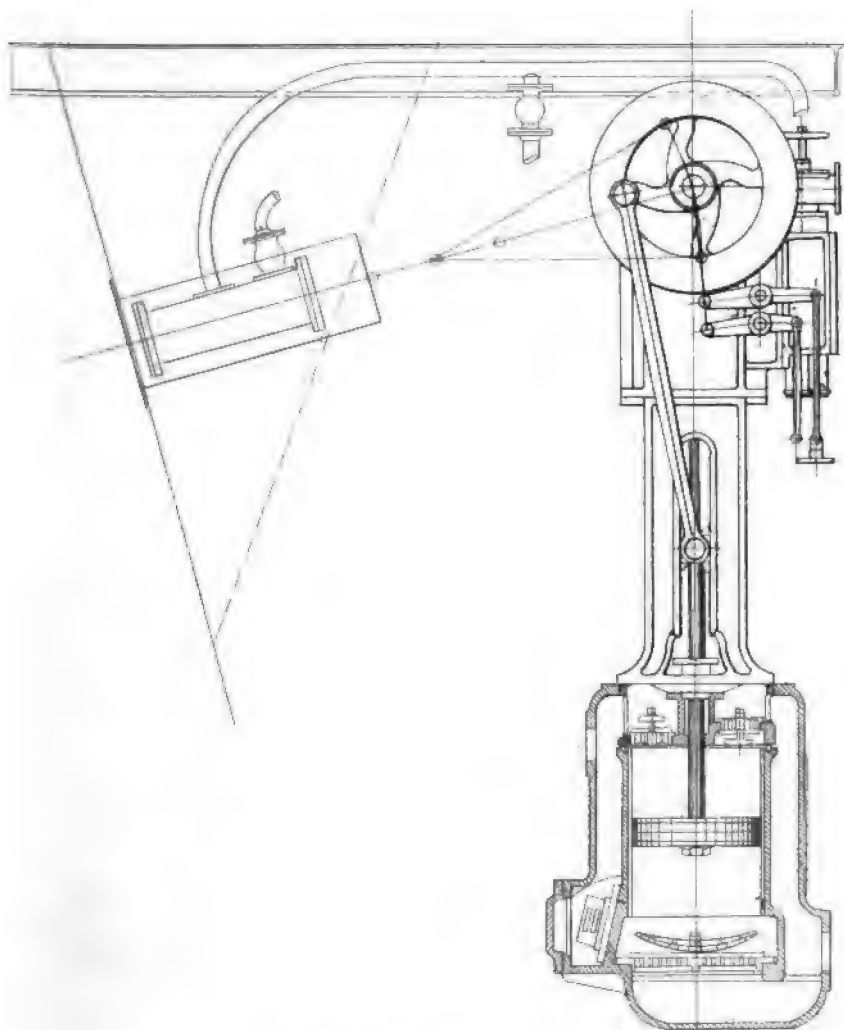
TWIN SCREW COMPOUND ENGINES
FOR THE
U.S. IRON CLAD "MIANTONOMOH"



*Plan of Engine & Boiler Space
U.S. Iron Clad Monitor*



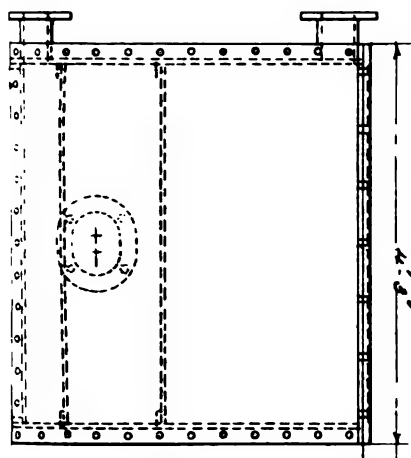
U.S. Iron and Steel Works
 Plan of Circulating Engine
 and Pump



Air Pump

U. S. Iron Clad *Miantonomoh*

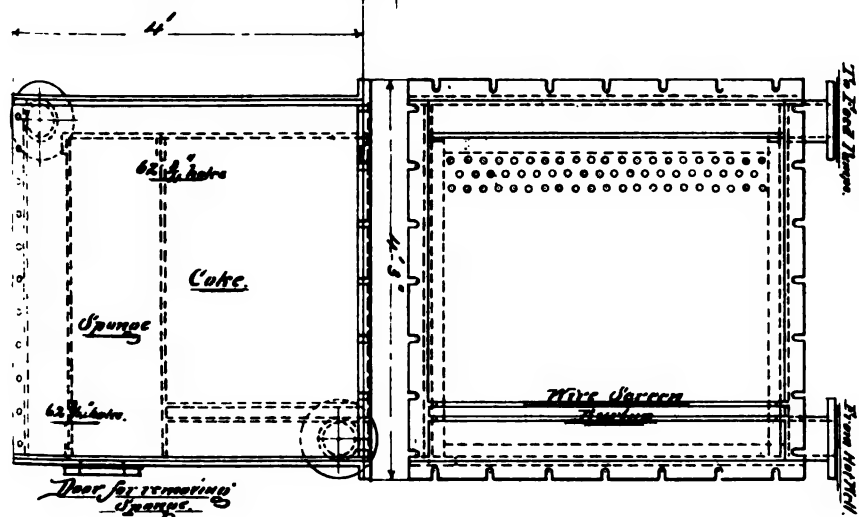
Additional Cylinder shown in red lines

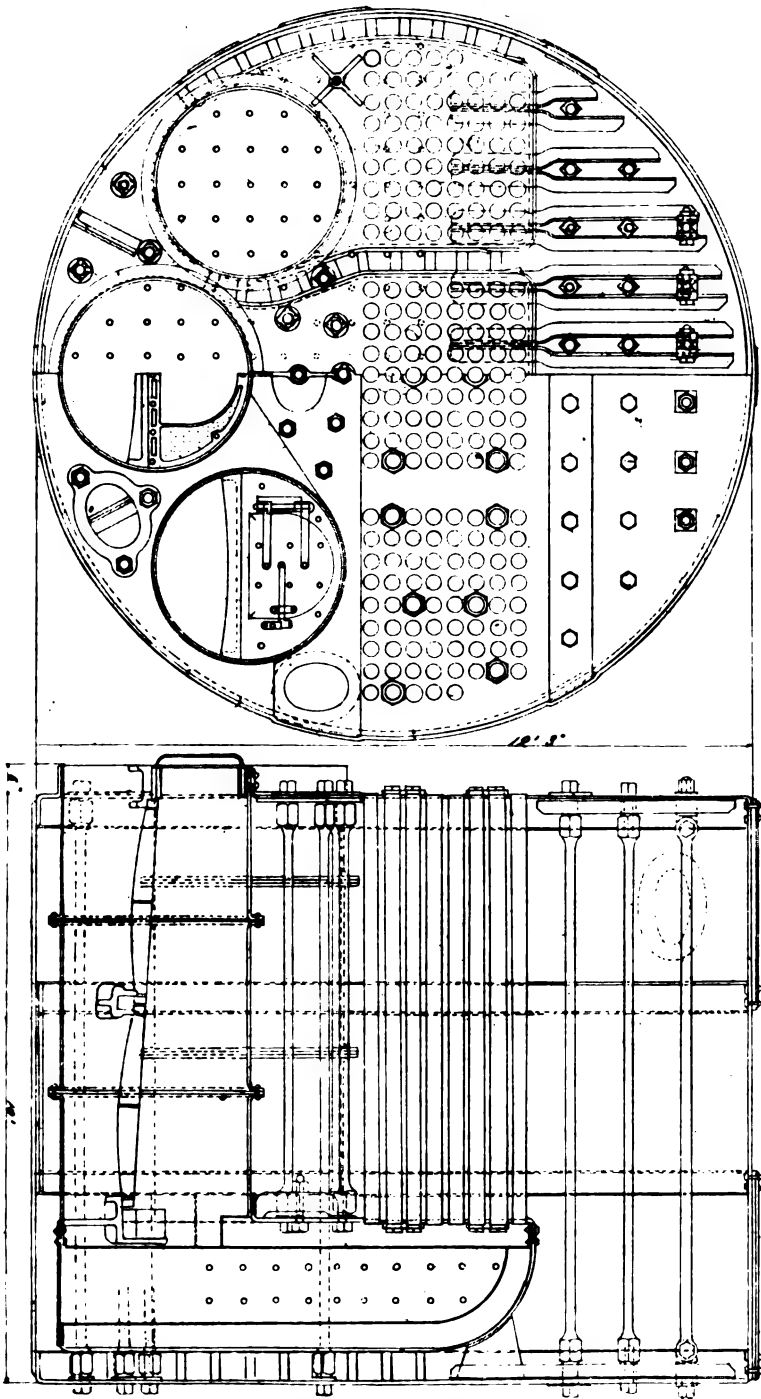


Water Filter

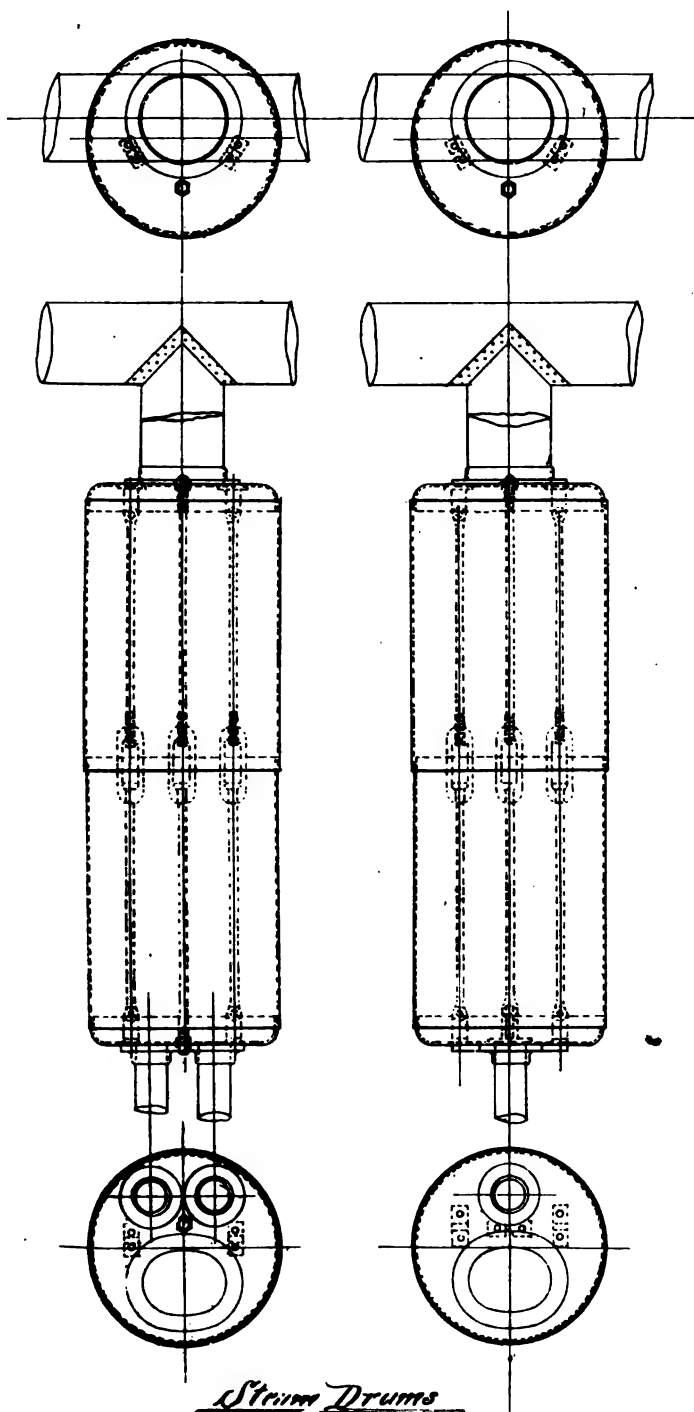
W.C. Seldens Pat.

U.S. Iron Clad "Mintamumuk"





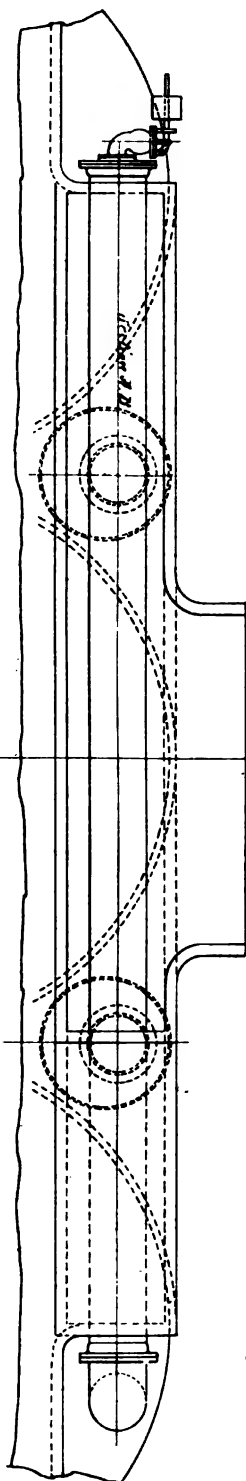
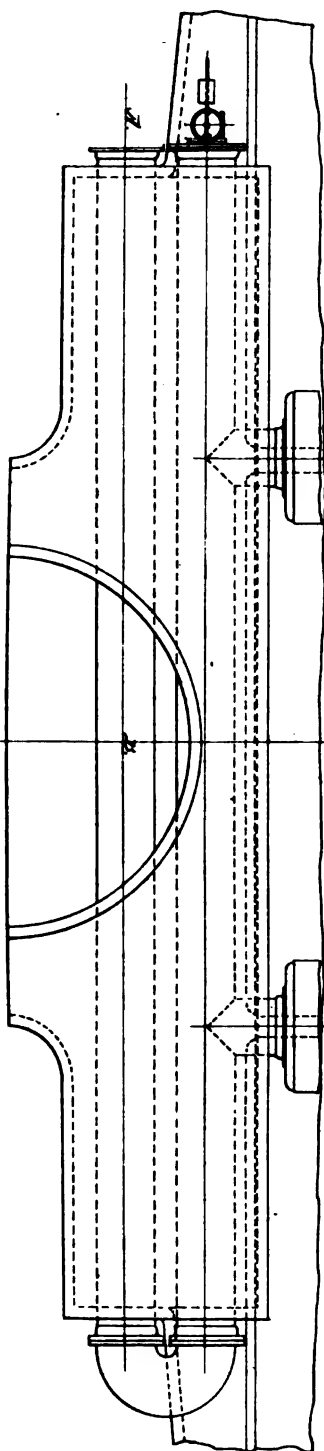
*Boiler, U.S. Iron Clad -
Mantonomah*

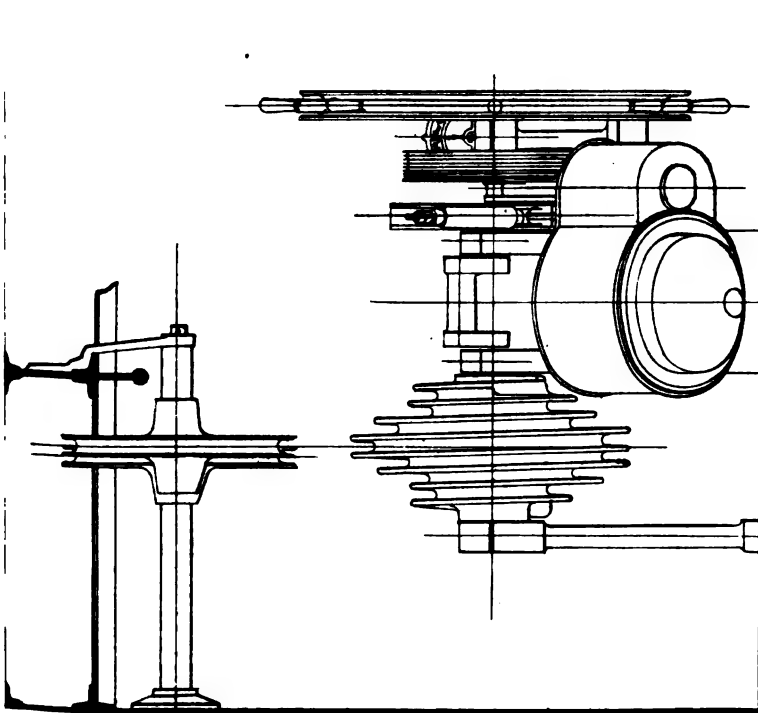
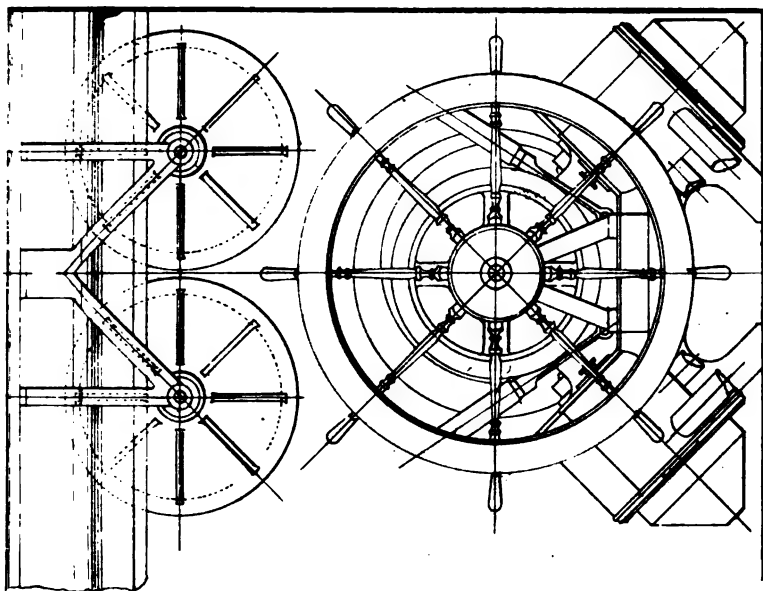


Steam Drums
U.S. Iron Clad "Miantonomah"

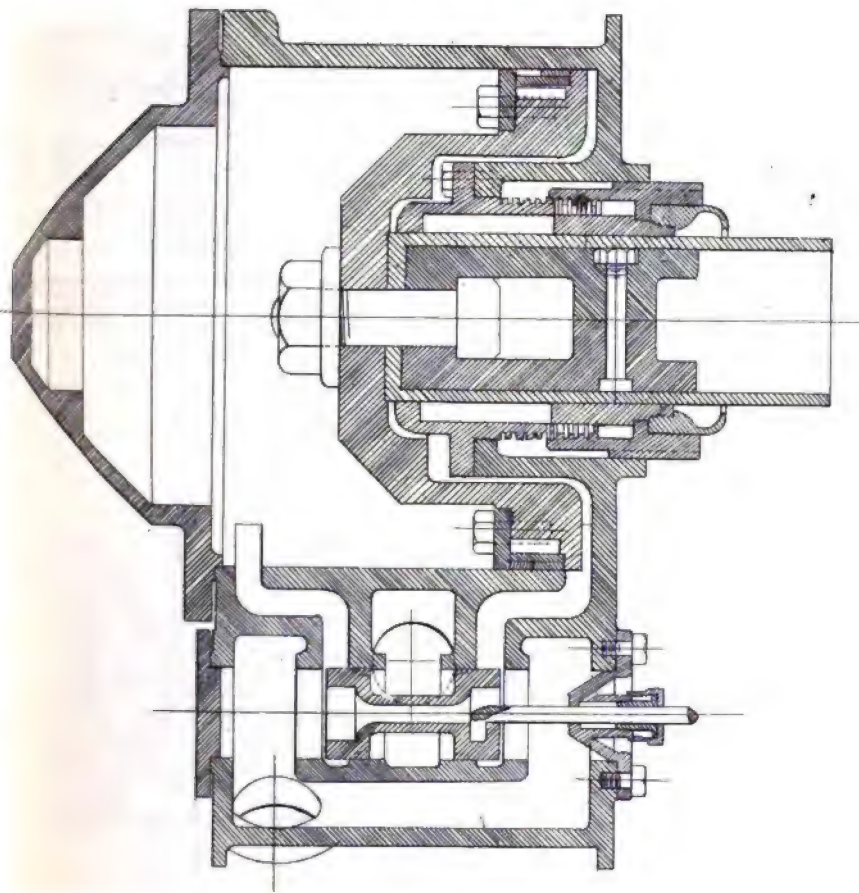
24 1/2 Iron Pipe 24 inches diameter

24 1/2 inch diameter

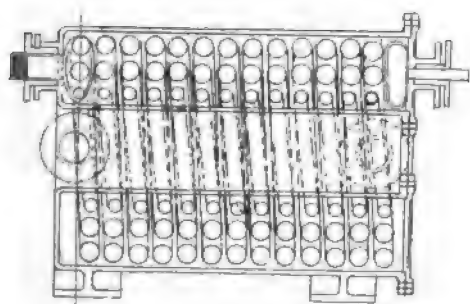
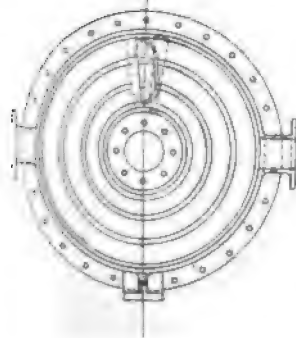
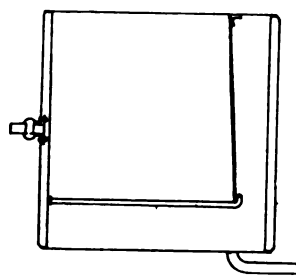
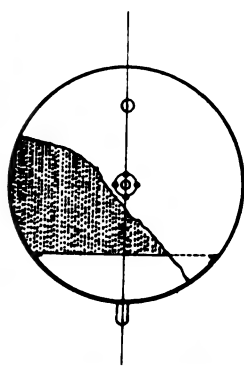
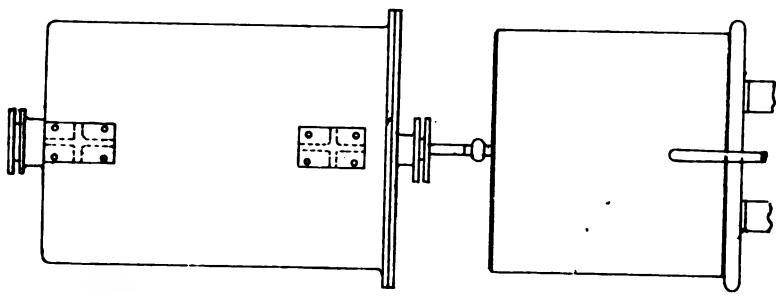
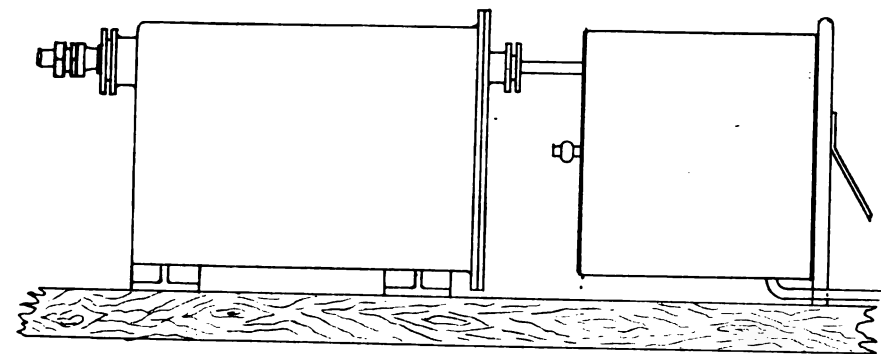




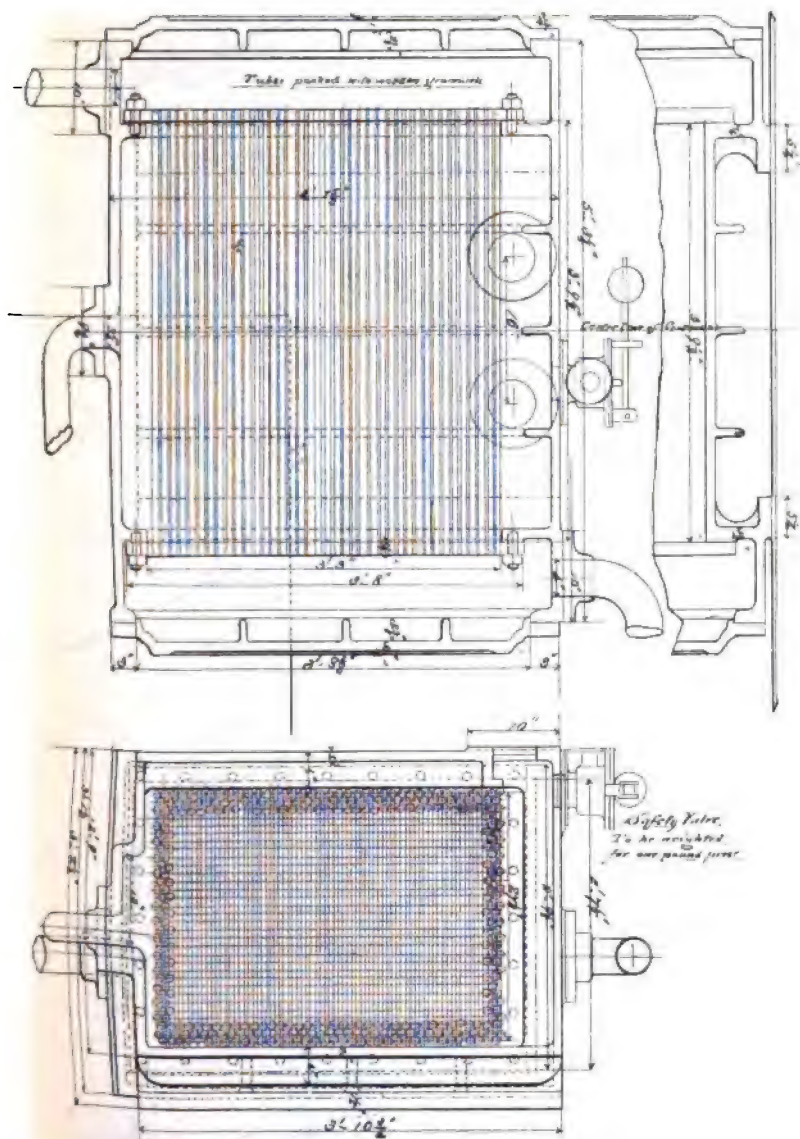
Steering Engine
For the U.S. Iron Steamer "Albatross"
Built by the Providence Steam Engine Co.
1877
Dickles - Talbot
Eng'g'g.



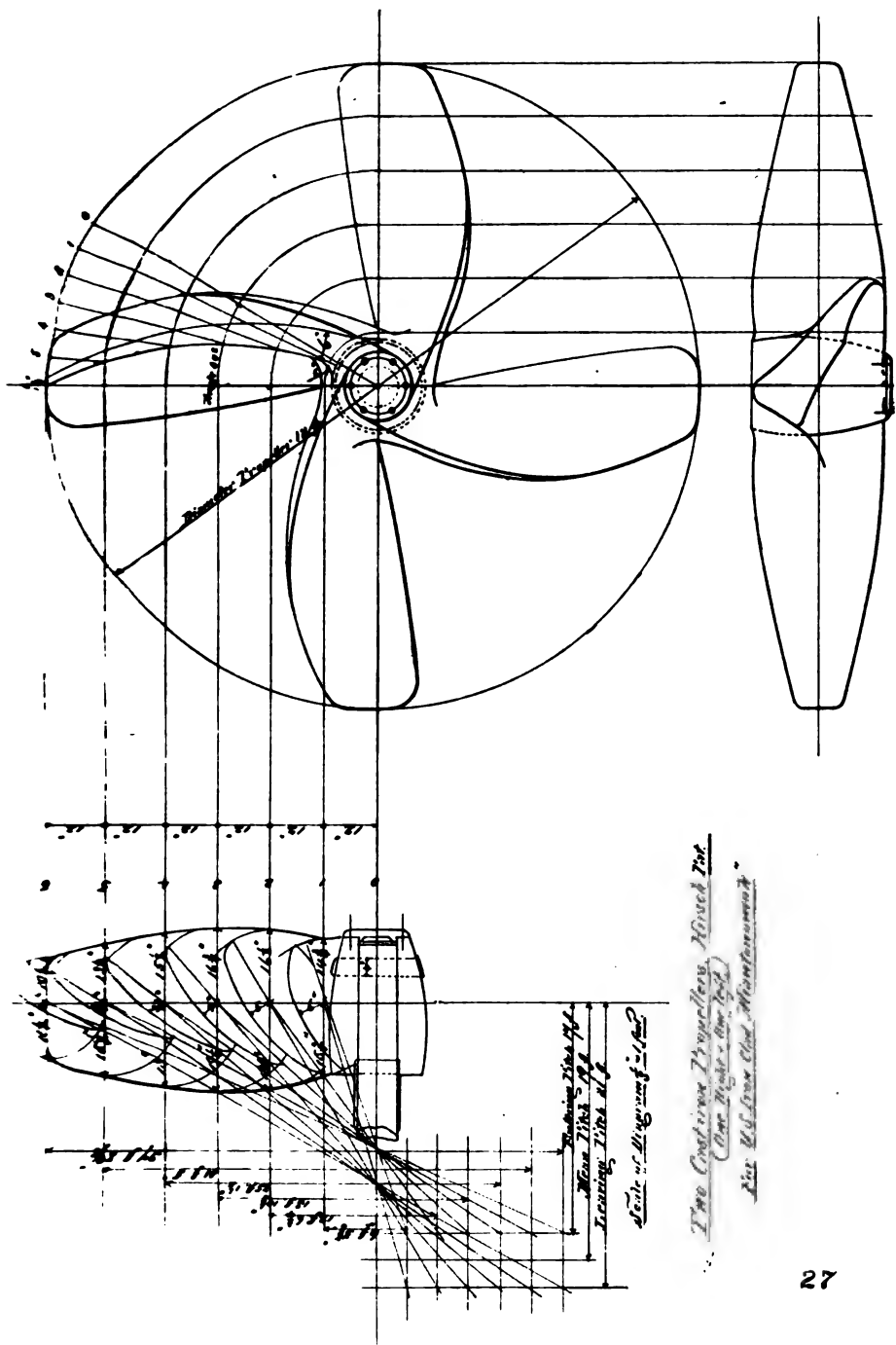
U.S. Iron Clad Monitor
Section of Steam Cylinder and Valve
For Steering Engines (Stickle's Patent)
Cylo 1859

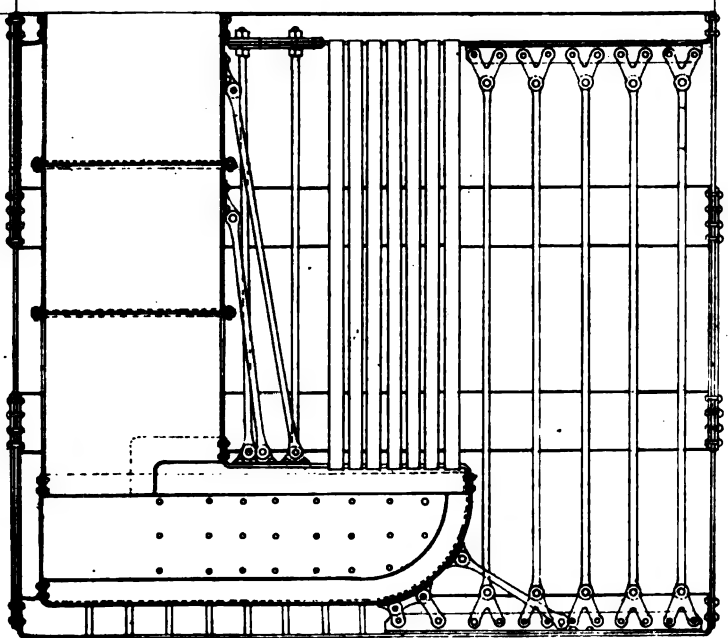
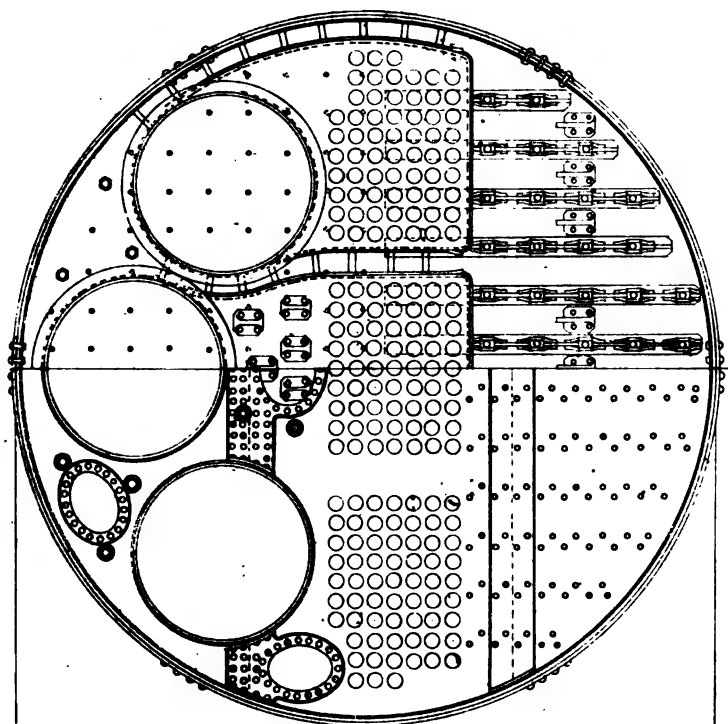


Distilling Apparatus U.S. Iron/Steel Manufacture.



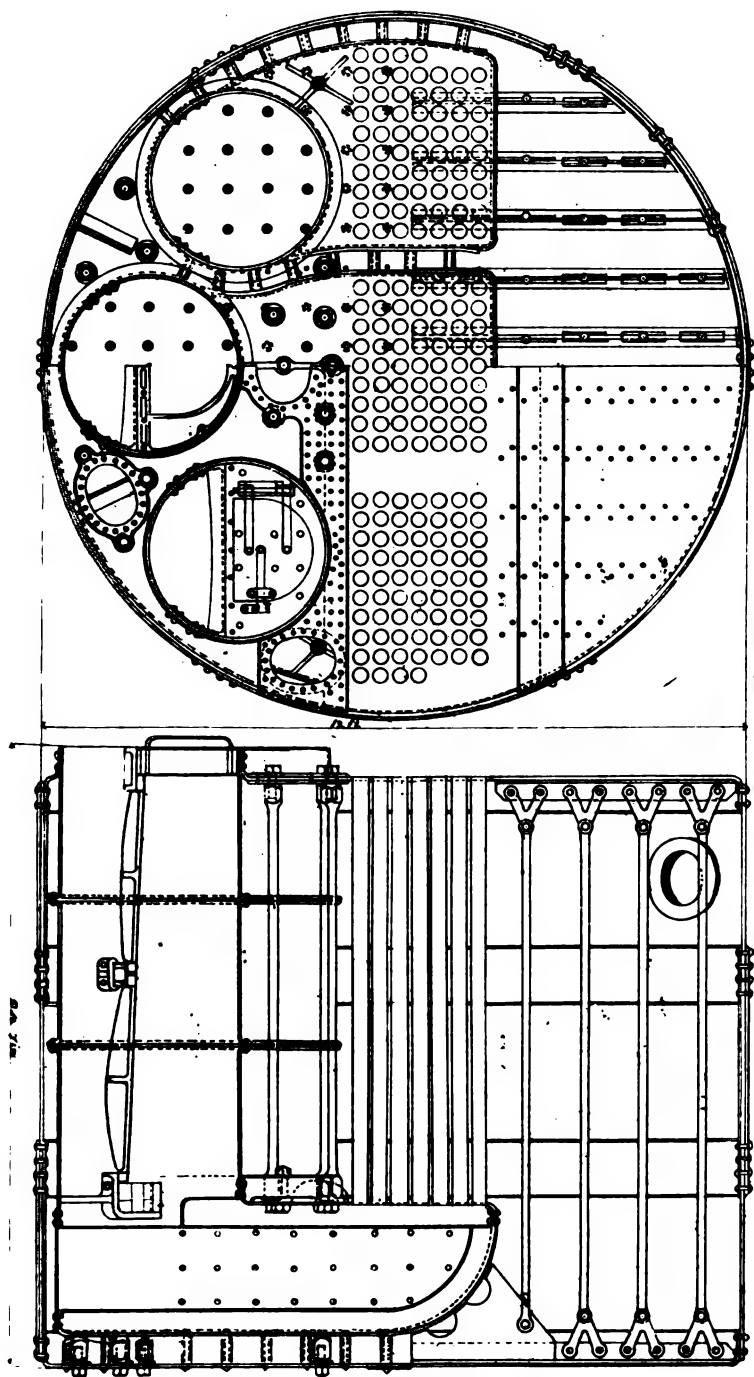
Condenser for Auxiliary Engines, Inc.
U.S. Iron and Mining Co.



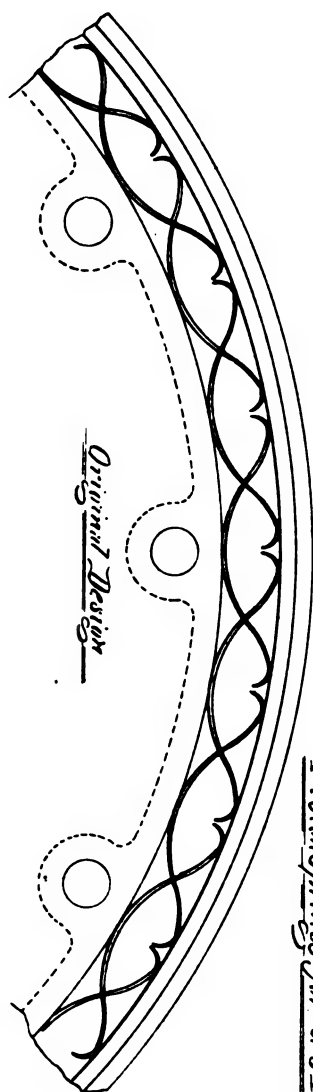


*Boilers - U.S. Iron Clad Monitor
 Section showing how Boilers of Iron Monitor
 May 14th 1876*

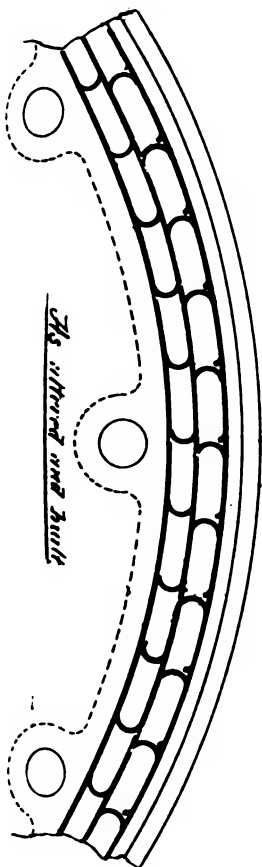
Boiler of the Iron Ship "Huntsville"
Copy of drawings submitted received from Bureau of Steam Engineering
showing sections of this boiler.



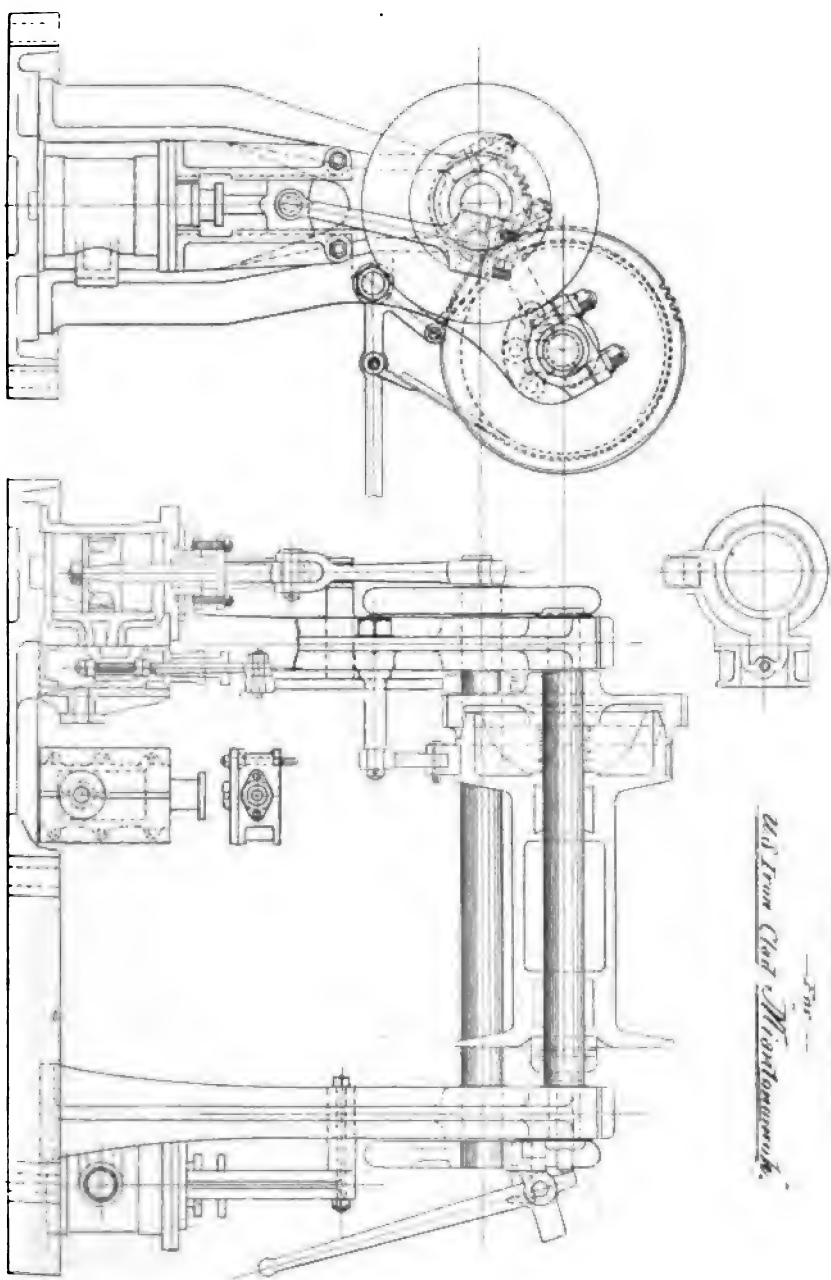
Pistonsprings for U.S. Iron Club "Whindermunk"



Original Design

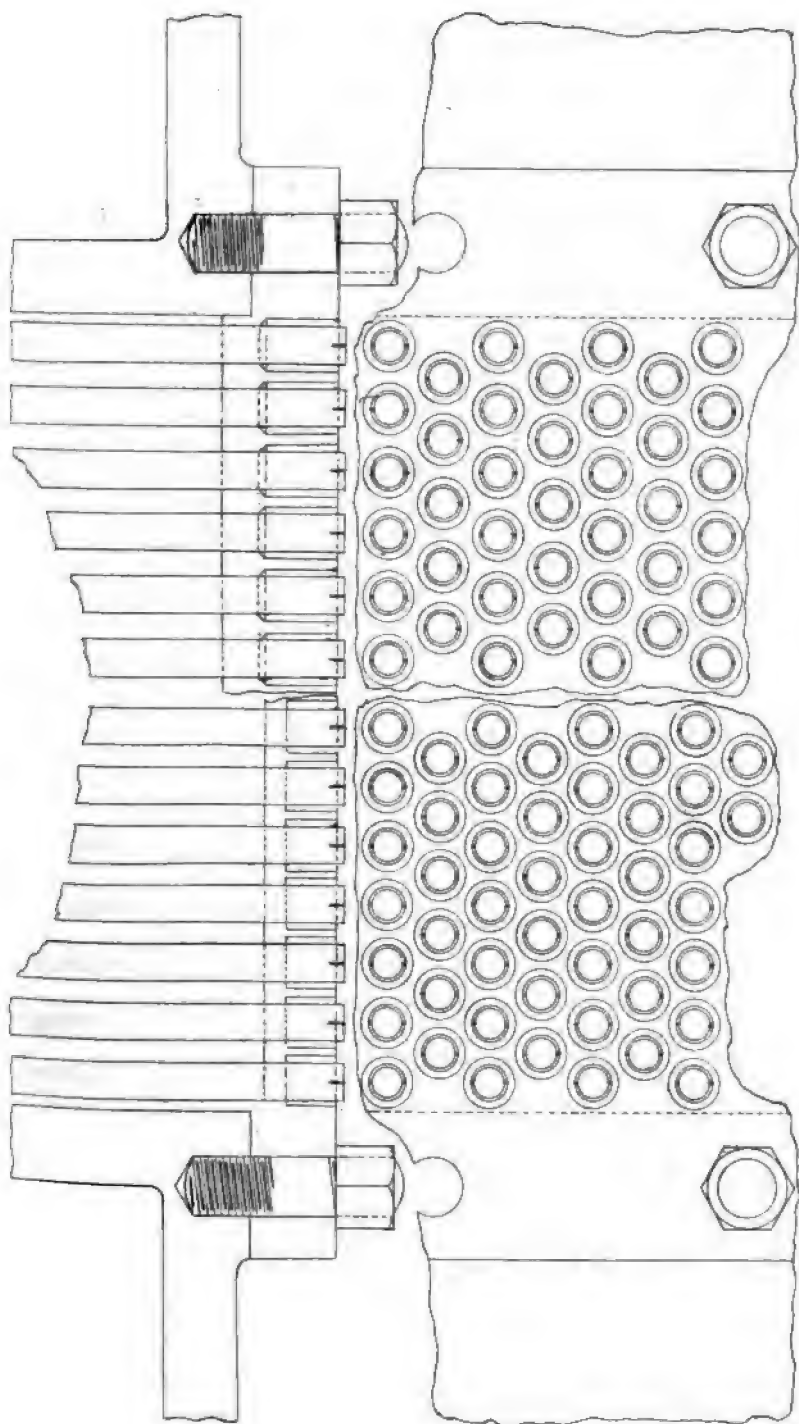


The spring and built

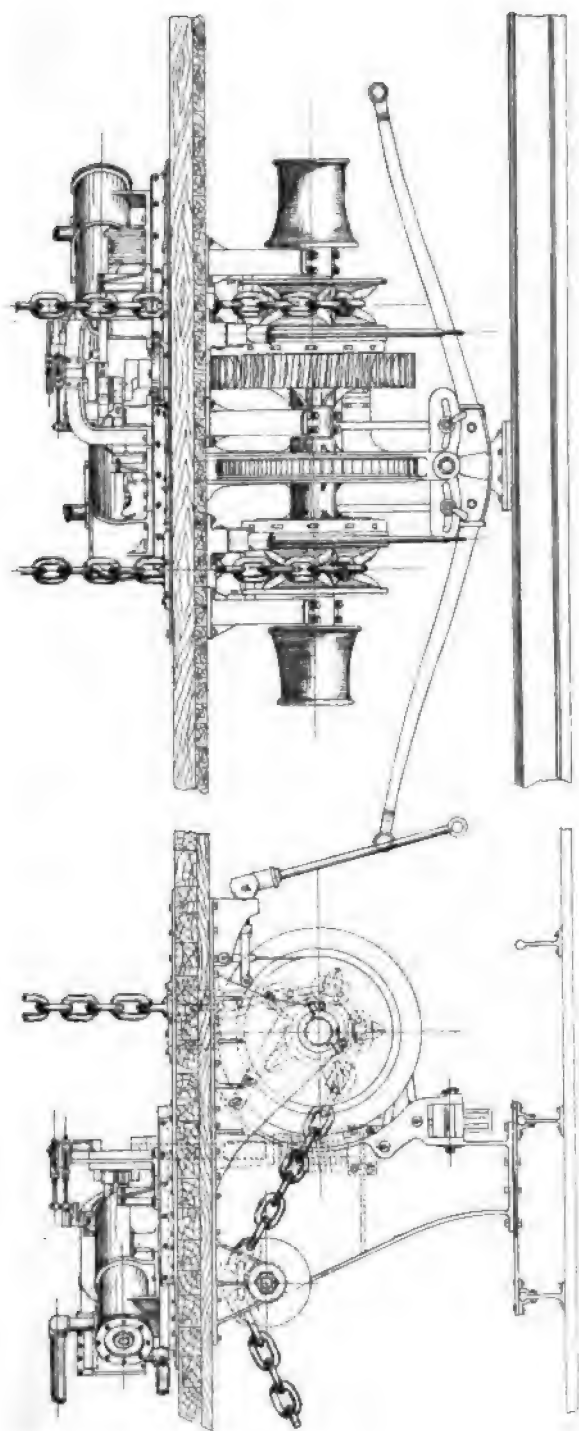


C. H. Hoister

U.S. Iron Cast & Manufacturing Co.



[illegible]



Anchor Winch
U. S. Iron Clad - Mantonomak

Hence, 1184862 =	528.95 tons.
2240	
And adding weight of water in boilers.....	87.72 tons.
We have the grand total of.....	616.67 tons.

And we are, sir, very respectfully, your obedient servants,

ALEXANDER HENDERSON,

Chief Engineer U. S. N., and Senior Member of Board.

JOHN H. LONG,

Chief Engineer, U. S. N.

H. N. STEVENSON,

Passed Assistant Engineer, U. S. N.

Engineer-in-Chief WILLIAM H. SHOCK, U. S. N.,

Chief of the Bureau of Steam-Engineering,

Navy Department, Washington, D. C.

SPECIAL WORK.

The following work has been done during the past year, in addition to the routine labor of fitting and repairing machinery, boilers, &c., on board naval vessels:

Boilers designed by the bureau of the description required for use in connection with the compound type of engines have been completed for the Nipsic. Steam-launch motive power, namely, thirteen boilers and nine engines, have been made at the navy-yard, Washington, and those not in service with the various naval vessels in commission are stored at the several navy-yards, for use as they may be required.

Three large screw-propellers of composition, aggregating a finished weight of 14 tons, have been cast at the navy-yard, Washington, from bureau designs, utilizing in their manufacture, as far as practicable, old material, scrap, and condemned propellers of obsolete types.

NAVY-YARDS.

The departments under cognizance of this bureau at the several yards, under their present organization and equipment, are in good working condition.

Your attention is respectfully called to my reports of November and December, 1877, in relation to certain additional buildings and equipments required at the navy-yards at Norfolk and Pensacola.

Now that the sectional dock for the Pensacola navy-yard has been safely transported to that place, and in view of the isolated condition (as regards facilities for repairs) of our vessels operating or stationed on that part of our coast, I would respectfully renew the recommendation contained in my last annual report, namely: " * * * it becomes a matter of the first importance to have the Pensacola navy-yard placed in the highest state of efficiency."

The tools required to equip the proposed additions to the shops could be supplied to some extent from the other yards, without materially affecting their present efficiency and requirements.

In this connection I would respectfully recommend an appropriation of \$25,000 for the purchase of tools and machinery in the following-named yards, to be divided as shown:

Pensacola navy-yard.....	\$10,000
Norfolk navy-yard.....	10,000
Mare Island navy-yard.....	5,000
Total	25,000

WORK REQUIRED.

The following will exhibit the character and extent of the work necessary to be carried out on the vessels enumerated, during the fiscal year 1880-'81, under the cognizance of this bureau:

Adams.—General repairs.

Alliance.—General repairs.

Ashuelot.—General repairs; work in progress on China station.

Brooklyn.—General repairs. New boilers placed and connected. New four-bladed screw propeller of bureau design.

Canandaigua.—Repairs to be completed.

Despatch.—To be supplied with new boilers, and engines to be thoroughly overhauled.

Hartford.—Extensive repairs. New boilers placed and connected. New four-bladed screw propeller of bureau design.

Iroquois.—Extensive repairs to engines. New boilers of bureau design to be constructed.

Juniata.—Thorough repairs. New boilers already completed to be placed in the ship. New four-bladed screw propeller of bureau design, and new crank-shaft.

LANCASTER.—Work has been commenced, taking out old engines and boilers, and erecting on board, new 60 by 36 inch engines, with new boilers which are on hand.

Michigan.—General repairs. Should have new boilers.

Monocacy.—General repairs.

Monongahela.—Thorough repairs to engines. New boilers to be constructed from bureau design. Ship out of commission.

Ossipee.—Extensive repairs to engines. New boilers to be constructed of bureau design.

Plymouth.—General overhauling and repairs.

Tallapoosa.—Needs new boilers.

Tuscarora.—Extensive repairs to engines. New boilers to be constructed of bureau design.

Yantic.—New boilers already completed and placed in the ship. A new four-bladed screw propeller of bureau design has been fitted, and the engines are being thoroughly overhauled.

EXPERIMENTAL INVESTIGATIONS.

The board of experienced engineer officers, in session at the navy-yard, New York, and of which Chief Engineer B. F. Isherwood, U. S. N., is president, continue experimentation upon such subjects as are submitted by the department, and the reports made from time to time are in the highest degree interesting and valuable alike to the naval service and to the general public.

With a view of increased efficiency and economy in boiler construction, and for the purpose of demonstrating by exhaustive experiments the best forms and proportions in staying and bracing of boilers, a board was convened at the navy-yard, Washington, for this purpose. The board consisted of Chief Engineer James P. Sprague, U. S. N., and Passed Assistant Engineer George E. Tower, U. S. N., and performed the duty assigned in the most thorough manner, reflecting great credit upon themselves and upon the service.

The results of these researches in the strength and distribution of material in boiler construction are embodied in Appendices A and B.

PERSONNEL OF THE ENGINEER CORPS.

The number of vacancies in the grade of assistant engineer is still quite large, but under the operation of existing law, and by reason of the high standard of qualification for entry at the Naval Academy, a large percentage of annual graduates is insured, and the existing vacancies will be filled from this source alone.

The present system of competitive examination for entry at the Naval Academy brings into the Engineer Corps the best talent, and as their numbers augment, their influence, tending to increase the efficiency of the Navy, will be more manifest with every succeeding class.

In this connection I will repeat what has been already said as to the advisability of abolishing the rate of machinist in the Navy; it is a worse than useless expenditure of public money to maintain a rate at a large compensation (if we take into account the character of talent usual with that class) for the performance of duties properly devolving upon a commissioned officer, and which should be carried on by him, and not by an irresponsible, and oftentimes ignorant, enlisted man.

“ * * * As a measure of economy to the government, the machinist system should be abolished at once, inasmuch as through their ignorance and carelessness the Bureau of Steam Engineering has been involved in expenditures for repairs amounting to many thousands of dollars.” * * *

“ * * * In another direction the interests of economy can be subserved by the abolition of machinists, viz: They number not far from 150, which, at a pay of \$900, represents an annual expenditure of \$135,000; and as they are included in the complement of men allowed by law for the Navy, they cripple its efficiency, in personnel, by a force about sufficient to man a vessel of the Yantic class; besides which, the duties assigned them can be performed, as they should be, by the passed assistant, assistant, and cadet engineers of the Navy.”

“ * * * As an economical and efficient substitute for the present expensive and unnecessary machinist system, I respectfully suggest the following: Let there be enlisted for every ship, when commissioned, whether large or small, and as a part of her complement of the engineer force, one blacksmith, one boiler-maker, and two finishers. All to be given the rate of ‘engine-room artisan,’ with a uniform pay of \$50 per month, and the usual rations. The change here suggested will insure a saving in money to the government of \$45,000 per annum, and an increase in the personnel of the Navy of about 150 men, as above stated.” * * *

APPRENTICE BOYS, ENGINEER DEPARTMENT.

Under the provisions of section 1518 of the Revised Statutes, boys between the ages of fifteen and eighteen years may be enlisted to serve in the Navy until they arrive at the age of twenty-one years.

Boys displaying some aptitude for mechanical pursuits and otherwise qualified are selected upon their own application for instruction in the engineer force, where they receive instruction in the coaling and working of fires, the construction and operation of boilers, the salinometer, steam, and water gauges, &c.

From accounts received from the various ships upon which these boys are serving in the engineer force they seem to give general satisfaction, and I am of the opinion that it is to this system that we must look for the men who are to make efficient and intelligent substitutes for the

present type of enlistments. The number detailed for the engineer department is not, as yet, fixed by law or regulation, and at the present time there are but twenty under instruction on the training-ship Minnesota, and about an equal number afloat in the various squadrons.

I would recommend that the system here inaugurated for firemen apprentices, be permanently organized by such legislation as may be necessary. By this means the rate of engine-room artisan recommended can be filled in a measure by men thoroughly competent to perform all of the duties pertaining to the rate; and this affords an additional argument for the abolition of the machinist system as being unnecessary, expensive, and superfluous.

PENSIONS FOR DISABLED MECHANICS.

In justice to a class of men deserving of the consideration of the government, I would respectfully recommend that such provision be made as in the wisdom of Congress may seem advisable to meet the necessities of this class of public servants; and beg to refer in this connection to my last annual report.

ESTIMATES.

I have the honor to submit herewith the annual estimates of this bureau for the fiscal year ending June 30, 1881.

Very respectfully,

W. H. SHOCK,
Chief of Bureau.

Hon. R. W. THOMPSON,
Secretary of the Navy.

Estimates of appropriations required for the service of the fiscal year ending June 30, 1881, by the Bureau of Steam Engineering, Navy Department.

Detailed objects of expenditure and explanations.	Estimated amount which will be required for each detailed object of expenditure.	Amount appropriated for the current fiscal year ending June 30, 1880.
SALARIES.		
Chief clerk, per act June 19, 1878, (Stat. at L., p. 198, ch. 329)	\$1,800	
Draughtsman, per act June 19, 1878 (Stat. at L., p. 198, chap. 329)	1,800	
Assistant draughtsman, per act June 19, 1878 (Stat. at L., p. 198, chap. 329) ..	1,600	
One clerk of class two, per act June 19, 1878 (Stat. at L., p. 198, chap. 329) ..	1,400	
One clerk of class two, submitted	1,400	
One clerk of class one, per act June 19, 1878 (Stat. at L., p. 198, ch. 329) ..	1,200	
One clerk, per act June 19, 1878 (Stat. at L., p. 198, ch. 329)	1,000	
One assistant messenger, per act June 19, 1878 (Stat. at L., p. 198, ch. 329) ..	720	
One laborer, per act June 19, 1878 (Stat. at L., p. 198, chap. 329)	660	
One laborer submitted	660	
	12,240 00	\$10,180 00
CONTINGENT.		
For stationery and miscellaneous items, per act June 19, 1878 (Stat. at L., p. 198, ch. 329)	1,500	700 00
STEAM MACHINERY.		
For preservation of machinery, boilers, &c., in vessels on the stocks, and in ordinary; purchase and preservation of all materials and stores; purchase, fitting, and repair of machinery and tools in the navy-yards and stations; wear, tear, and repair of machinery, boilers, &c., of naval vessels; incidental expenses, such as foreign postages, telegrams, advertising, freight, &c., appropriated per act of February 14, 1879 (Stat. at L., p. 280, ch. 68)	800,000 00	800 000 00

Estimates of appropriations required for the service, &c.—Continued.

Detailed objects of expenditure, and explanations.	Estimated amount which will be required for each detailed object of expenditure.	Amount appropriated for the current fiscal year ending June 30, 1880.
CONTINGENT.		
For instruments, materials, &c., for draughting-rooms, &c., appropriated per act of February 14, 1879 (Stat. at L., p. 289, ch. 68)	\$1,000 00	\$1,000 00
CIVIL ESTABLISHMENT.		
Pensmouth, N. H., navy-yard:		
One clerk	\$1,300 00	
One writer (store)	1,017 25	
	2,317 25	
Boston Mass., navy-yard:		
One clerk	1,300 00	
One writer (store)	1,300 00	
	2,600 00	
Brooklyn, N. Y., navy-yard:		
One clerk	1,400 00	
One clerk	1,300 00	
One writer (store)	1,017 25	
	3,717 25	
League Island, Pa., navy-yard:		
One clerk	1,300 00	
One writer (store)	1,017 25	
	2,317 25	
Washington, D. C., navy-yard:		
One clerk	1,300 00	
One writer (store)	1,017 25	
One writer	1,017 25	
	3,334 50	
Yorfolk, Va., navy-yard:		
One clerk	1,300 00	
One writer (store)	1,017 25	
	2,317 25	
Pensacola, Fla., navy-yard:		
One writer		1,017 25
Marine Island, Cal., navy-yard:		
One clerk	1,400 00	
One clerk, per act February 14, 1879 (Stat. at L., p. 289, ch. 68) ..	1,300 00	
	2,700 00	
	20,320 75	20,038 00

APPENDIX A.**NAVAL ACADEMY,
Annapolis, Md., October 25, 1879.**

SIR: In obedience to the orders of the Bureau of Steam Engineering "to make a series of experiments to determine the value and resistance of screw stay-bolts for boilers under different conditions, using iron, steel, and copper plates of different thicknesses," &c., we respectfully state that we have complied as fully as possible during the time occupied, and that every care and precaution was used to insure accuracy; that in every experiment where there was the least doubt it was set aside and another trial made. Want of time prevents the discussion of the matter as fully as desirable; but we beg leave to submit the inclosed plates, data, &c., with a short *resumé* of the work, results, and those points brought most prominently into notice during the tests. In connection with and illustrating these experiments the following tables and sketches are respectfully submitted:

Tables A, A¹, A², showing comparative resistance of iron screw stay-bolts, under different conditions, to being pulled through iron boiler-plate.

Table A³. Results (for comparison) of pulling iron screw stay-bolts through "low" steel boiler-plate.

Tables B, B¹. Results (for comparisons) of pulling copper screw stay-bolts through iron boiler-plates.

Tables C, C¹. Results (for comparisons) of pulling iron screw stay-bolts through copper boiler-plates.

Table D. Results (for comparisons) of pulling copper screw stay-bolts through copper boiler-plates.

Plate X shows the arrangement of the bolts for the above tests for comparisons.

Plates 1 to 45, showing data and sketch (after rupture) of the different experiments on iron and low steel stay-bolts, and iron, low steel, and copper boiler-plates; arranged so as to represent a section of a fire-box.

Tests to determine the comparative force necessary to pull screw stay-bolts of iron and copper through iron, low steel, and copper boiler-plates.

1. All plates of each material, of the same thickness, were cut from the same sheet.

2. All stay-bolts of each material were made from the same bar, or from bars of the same lot, which, after testing, were found to be as nearly similar as possible in all respects.

3. Three specimens of each size and thickness were tested.

4. All tests were carefully observed until rupture. Three trials each were first made with $\frac{1}{2}$ " iron plates and 1" iron stay-bolts, not riveted, and riveted over with the ordinary thin or low conical head, simply arranged so as to show the actual strength, to resist pulling through the plate, the supports consisting of heavy plates, with a hole $1\frac{3}{4}$ " in diameter; the boiler plate resting upon the heavy plate and the stay-bolt adjusted to the center of the hole; thus allowing the bolt to have a clear space around it equal to the overlapping of the riveted head on the boiler plate. The bolts not riveted drew out at an average strain of 32,785 pounds; those riveted with the low conical head made according to general practice, by leaving thin threads through to form the head, required an average strain of 35,033 pounds to draw them through the plate; the rivet-head giving an additional strength of 2,248 pounds in a 1" stay-bolt.

In testing those with low conical heads, it was observed that the bulging of the plates caused the lap of the rivet-head on the plate to commence giving way or break off some time before the maximum strain was reached, thus leaving more for the threads on the bolts to sustain. As the strain and bulge of the plates increased, the plate around the bolt turned downward and outward until the threads in the plate almost entirely cleared those on the bolts, so that in almost every case there were only from one to two threads stripped or injured on the bolt when it drew out; therefore it was deemed advisable to form the head in a different manner, and, after several experiments, it was decided that the rivet-head should be made as follows: First, by leaving as much of the bolt through the plate as could be riveted over without injury to the iron, which was, in case of the excellent iron being used, equal in length to about one-half the diameter of the bolt. This was riveted over in the following manner: A few quick, sharp blows were struck on the end, slightly upsetting the iron; the head was then formed to shape with a button-head set made to a spherical segment.

It was found that this could be done in nearly the same time as that used in riveting the ordinary low conical stay-bolt heads at the Washington yard, and with much less injury to the iron; also, that it only

required one riveter and a helper; whereas, by the old method, two riveters were used.

Three trials each were then made with $\frac{1}{2}$ " iron plates and 1" iron stay-bolts (arranged as shown in Plate X), not riveted; riveted with ordinary low conical head, with 3 threads left through for riveting; riveted with button-head, a little over 5 threads left through for riveting; and with button-head, the size of stay-bolt being increased to $1\frac{1}{4}$ ". The supports were by bolts in each corner of the plate, 4" and 5" from center to center of supports; the stay-bolt being in the center of the plate, equally distant from each support.

The ultimate average strain required to pull the above bolts through the $\frac{1}{2}$ " plate was as follows:

With supports 4" from center to center.

	Pounds.
1" bolt, not riveted.....	21, 970
1" bolt, ordinary low conical head, 3 threads left through for riveting	25, 147
1" bolt, button-head; length of bolt left through for riveting equal to $\frac{7}{8}$ diameter of bolt.....	33, 791
$1\frac{1}{4}$ " bolt, button-head; length left through for riveting equal to $\frac{1}{2}$ diameter of bolt	38, 885

With supports 5" from center to center.

1" bolt, ordinary low conical head	22, 137
1" bolt, button-head; length left through for riveting equal to $\frac{7}{8}$ diameter of bolt	31, 282
$1\frac{1}{4}$ " bolt, button-head; length left through for riveting equal to $\frac{1}{2}$ diameter of bolt	35, 812

The above shows what important factors the rivet-head, and manner in which it is formed, as well as the size of the bolt, are to screw stay-bolts for surfaces resisting internal pressure.

Experiments on screw stay-bolts and plates, arranged to represent a section of a fire-box, water being used to produce the strain.

These drawings show the apparatus as used in each experiment. It consists of a composition ring 4 inches deep, 18 inches internal and 23 inches external diameter, faced true on both sides, and having thirty-one holes for $\frac{7}{8}$ -inch through bolts; and on each side of the connecting-pipe to the pump a hole was tapped for a bolt of the same diameter. These holes were laid off and drilled equidistant on a circle $20\frac{1}{2}$ inches in diameter.

The bolts for securing the plates to the ring were of steel, turned and chased to fit $\frac{7}{8}$ -inch hexagonal nuts. The joints between the plates and ring were made with a sheet-lead gasket coated with soft red-lead putty.

After a few experiments with stay-bolts, riveted at both ends, and plates of equal thickness on both sides of the ring (for economizing the number of plates used), a $\frac{3}{4}$ -inch steel plate, having holes that allowed the stay-bolt to pass freely through them, was used for a back plate, as is shown in the drawings of most of the experiments.

The stay-bolts where they passed through the back plate were packed under the washer with lamp-wick and red-lead putty, and the nuts were screwed up firmly before the riveted head was made on the other end of the bolt.

All the experimental plates were cut to the diameter of the outside of the composition ring, made flat, and the holes drilled accurately.

The iron plates were selected from a lot made and delivered by the manufacturers at the same time. Those of the same thickness were cut where possible from the same sheet.

The Otis steel plates were received of the right size and shape from the manufacturers.

The copper plates were rolled per order from one quality of material at the navy-yard, Washington.

The iron stay-bolts were made from $1\frac{1}{4}$ -inch and $1\frac{1}{2}$ -inch round bars that had stood bending through 180 degrees cold without showing signs of fracture, and of a tensile strength ranging from 51,000 to 52,000 pounds per square inch.

The Otis steel stay-bolts were made from bars of that material that were of the diameter required for the bolts. The tensile strength per square inch of the 1-inch bar was 58,869 pounds, and of the $1\frac{1}{4}$ -inch bar 52,825 pounds.

The threads on the stay-bolts were cut to screw tightly through the holes tapped in the plates, and the exact number stated in the data were left projecting to form the heads. The riveting was done with great care; the low conical or ordinary heads were made and finished with hammers in the usual manner. The upsetting for the segmental heads was done with hammers, and the shaping and finishing with the button-head set.

Where *nuts* were used in the place of riveted heads, the stay-bolts were screwed through the plate and the nuts set up tightly against it. The nuts were faced on their bearing side and then dished out $\frac{1}{8}$ of an inch deep, leaving a bearing surface in the form of a ring around the outside. The dished space was filled with red-lead putty made stiff with fine iron borings. *The measurements* for the bulge of the plate were taken while the pressure was on the apparatus, and those for the set were taken after it had been relieved.

Both measurements were from points (between the stay-bolts) found to be the highest, and in no case were they taken from less than four places in each plate.

The figures on the stay-bolts, where found in the drawings, show the elongation of the bolt in inches during the test.

The pressure-gauges were frequently tested to insure accuracy.

Forty-five (45) experiments were made with iron and steel stay-bolts and iron, steel, and copper boiler-plate, arranged to represent a section of a fire-box.

The steel plates and bolts were made from a low steel, manufactured by the Otis Steel Company, of Cleveland, Ohio. The stay-bolts possessed a remarkable malleability, requiring comparatively very little hammering to form the rivet-head. In comparing the results of three different thicknesses, in each case ($\frac{1}{4}$ ", $\frac{3}{8}$ ", $\frac{1}{2}$ " plate) of iron plates and iron bolts, steel plates and iron bolts, steel plates and steel bolts, the diameter of the bolts being 1", $1\frac{1}{8}$ ", and $1\frac{1}{4}$ ", their distance apart and conditions of trial being the same, it was found that in the case of the iron plates and iron bolts the strain required to draw the bolts through the plates was equal to 74.77 per cent. of the tensile strength of the bolt, with the steel plates and iron bolts 77.36 per cent., and with the steel plate and steel bolts 85.42 per cent.

The following is a comparison of results in regard to the best methods of forming or securing the heads of screw stay-bolts for steam-boilers, the thickness of the plates ($\frac{1}{4}$ ") and the distance apart of the bolts (5") being the same in each case; the amounts given are in pounds per square inch of surface supported:

1" bolt, ordinary low conical head (see Plate 2a)	580 pounds.
1" bolt, button-head (spherical segment) (see Plate 3b)	790 pounds.
Difference in favor of button-head, 210 pounds, or 36.2 per cent.	

Below is a similar comparison with $\frac{3}{8}$ " plates and bolts 6" from center to center:

1" bolt, ordinary low conical head (see Plate 8f).....	650 pounds.
1" bolt, button-head (spherical segment) (Plate 9g).....	800 pounds.
Difference in favor of button-head, 150 pounds, or 23 per cent.	

As a means of comparison for strength only, the following experiments (thickness of plates and distances apart of bolts same as above) were made with nuts instead of riveted heads, the nuts being of the standard size for the diameter of bolt used and fitted in accordance with the data on the sketches and note in the general explanation in regard to the experiments:

	Pounds.
1" bolt, 4" from center to center, bearing surface a little more than rivet (see Plate 33c).....	1,000
1" bolt, 6" from center to center, bearing surface a little more than rivet (see Plate 36h).....	1,300
1" bolt, 5" from center to center, bearing surface double that of above rivet (see Plate 34d).....	1,500
$\frac{1}{4}$ " bolt, 5" from center to center, bearing surface double that of above rivet (see Plate 35e).....	1,650

By comparing the above, it will be seen that there was a gain of from 23 to 36.2 per cent. in favor of the button-head over the ordinary low conical head. Also the percentage in *strength* over all was largely in favor of the nuts, which would be of value in surfaces not exposed to the action of extreme heat and flame, experience having shown that the difficulties in preventing leakage around the thread and the burning away of the nuts materially affects their durability and efficiency.

Want of time prevents the discussion of all the experiments in regard to the resistance of screw stay-bolts in flat surfaces. But in reference to iron and low steel bolts, and iron and low steel plates, and copper plates and iron bolts, after a careful examination of the results of these experiments in particular, we are satisfied that the following formulæ will correctly and safely represent the working strength of good material in flat surfaces, supported by screw stay-bolts with riveted button-shaped heads or with nuts, when the thickness of the plates forming said surfaces and the screw stay-bolts are made in accordance with the dimensions and conditions given in table Y. W = safe-working pressure; T = thickness of plate; d = distance from center to center of stay-bolt:

For iron plates and iron bolts.....	$W = 24000 \frac{T^3}{d^2}$
For low steel plates and iron bolts.....	$W = 25000 \frac{T^3}{d^2}$
For low steel plates and low steel bolts.....	$W = 28000 \frac{T^3}{d^2}$
For iron plates and iron bolts, with nuts.....	$W = 40000 \frac{T^3}{d^2}$
For copper plates and iron bolts.....	$W = 14500 \frac{T^3}{d^2}$

To obtain the ultimate bursting pressure, multiply the results of the above formulæ by 8, which is the factor of safety used.

TABLE Y.—Dimensions and conditions for making iron and low steel screw stay-bolt flat surfaces subject to internal pressure for distances ranging from four to eight (inclusive) from center to center of stay-bolt.

Thickness of plate.	Diameter of bolt outside of thread.	Number of threads per inch.	Length of bolt left through for riveting in fractions of chin of bolt.	Height of rivet-head when finished.	Diameter of base of rivet-head not to exceed when finished—	Nuts.	
						Breadth of annular bearing surface.	
1/2"	1"	14	1/2"	1 1/2"	1 1/2"	1 1/2"	
3/4"	1 1/4"	14	3/4"	1 3/4"	1 3/4"	1 3/4"	
1"	1 1/2"	12	1"	2"	2"	2"	
1 1/4"	1 3/4"	12	1 1/4"	2 1/4"	2 1/4"	2 1/4"	
1 1/2"	2"	12	1 1/2"	2 1/2"	2 1/2"	2 1/2"	

The rivet-heads to be a segment of a sphere, formed by first upsetting the end of the bolt with a few quick, sharp blows of the hammer finished to shape with the hammer and button-head set. When can be used instead of riveted heads, they should be of the standard size, suited to the diameter of the bolt, faced on the side bearing on the plate, and dished out so as to form an annular bearing surface of as small a diameter as the nut will allow, and of a breadth and depth given in the table. Before securing the nut in place the dished portion should be filled with red-lead putty made stiff with fine iron borings.

Respectfully submitted.

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AT



































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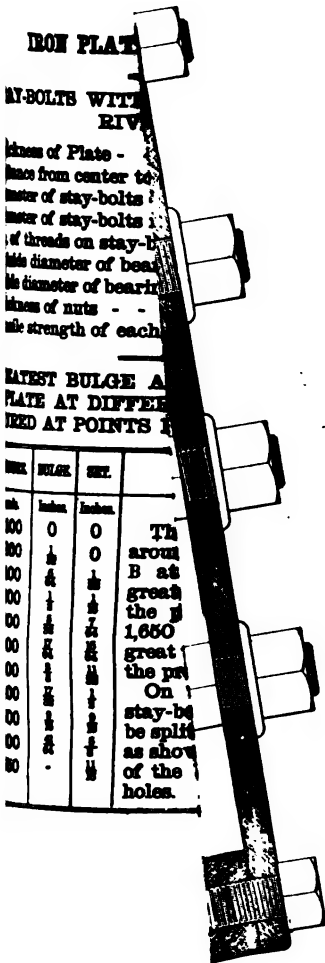








LATE XX





LATE

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SIZE	NUMBER
200	1
300	2
400	3
500	4
600	5
700	6
800	7
900	8
1000	9
1100	10
1200	11
1300	12
1400	13
1500	14







TABLE A.

Experiments with screw stay-bolts, with ends not riveted, riveted over with the ordinary low conical head, riveted over with a button-head set, and with stay-bolts of an increased size, riveted over with button-head set. Also two experiments to show the force necessary, simply, to draw the bolt through the plate, both when not riveted and when riveted with low conical head. Tensile strength of bar for bolts 54, 438 pounds per square inch. The arrangement of plates and stay-bolts is shown in Plate X.

Number and mark of specimens.	Thickness of plate.	Diameter of stay-bolt outside of thread.	Diameter of stay-bolt inside of thread.	Distance from center of support to center of stay-bolt.	Number of threads left through for riveting.	Mean diameter of head after riveting.	Number of threads on bolts to the inch.	Thickness of rivet-head at crown.	Plate bulge at—	Kind of rivet-head.	Bolt or plate gave way at—	Total bulge of plate after rupture.	Remarks.
1.....	Inches. .5	Inches. 1.017	Inches. .920	Inches. Support was a hole 13" diameter in a heavy plate.	.....	Inches. Not riveted.	12	Inches.	Lbs.	Threads only projecting.	Lbs. 36,085	Inches. Not perceptible	Bolts pulled through, stripping threads in plate and bolt.
11.....	.5	1.017	.920	.....	.....	do	12	.....	.....	do	33,860	do	This plate was supported the same as that below, with a plate (heavy) with 13" hole.
111.....	.5	1.017	.920	.....	.....	do	12	.....	.....	do	28,400	do	
Average.	.5	1.017	.920	.....	.....	.....	12	.....	.....	.....	32,785	.....
1.....	.5	1.020	.9	.....	2—	1 1/2	12	1 1/2	.....	Ordinary thin conical head.	Lbs. 34,770	Not perceptible	Stay bolts broke between plates; they were riveted with thin head in the usual manner.
11.....	.5	1.020	.9	Same as above.	2—	1 1/2	12	1 1/2	.....	do	30,340	do	The plate was supported by a heavy plate, in which was a hole 13" in diam., the stay-bolt passing through the hole to its place of attachment.
111.....	.5	1.020	.9	.....	3—	1 1/2	12	1 1/2	.....	do	34,800	do	Head of rivet was apparently uninjured.
Average.	.5	1.020	.9	.....	3	1 1/2	12	1 1/2	.....	.....	35,033	.....
1.....	.498	1.015	.919	4	.....	Not riveted.	12	.....	12,700	Thread only projecting.	Lbs. 22,650	1 1/2	Bolts pulled through, stripping threads on bolt, and one-half of them in the plate.
11.....	.498	1.015	.919	4	.....	do	12	.....	14,000	do	21,720	5/8	
111.....	.498	1.015	.919	4	.....	do	12	.....	14,000	do	21,600	1 1/2	
Average.	.498	1.015	.919	4	.....	.....	12	.....	13,566	.....	21,970	1 1/2	
1.....	.5	1.020	.9	4	3—	1 1/2	12	1 1/2	.....	Ordinary thin conical head.	Lbs. 24,510	.39	1 and 14 threads injured; the bulge of the plate allowed the other threads of the bolt and the plate to clear each other, so as to leave them uninjured.
11.....	.5	1.020	.9	4	3—	1 1/2	12	1 1/2	.....	do	24,830	.33	

TABLE A.

Experiments with screw stay-bolts, with ends not riveted, riveted over with the ordinary low conical head, riveted over with a button-head set, and with stay-bolts of an increased size, riveted over with button-head set. Also two experiments to show the force necessary, simply, to draw the bolt through the plate, both when not riveted and when riveted with low conical head. Tensile strength of bar for bolts 54,438 pounds per square inch. The arrangement of plates and stay-bolts is shown in Plate X.

Number and mark of specimens.	Thickness of boiler plate.	Diameter of stay-bolt outside of thread.	Diameter of stay-bolt inside of thread.	Distance from center of support to center of stay-bolt.	Number of threads between through for riveting.	Mean diameter of head after riveting.	Number of threads on bolts to the inch.	Thickness of rivet-head at crown.	Plate commenced to bulge at—	Kind of rivet-head.	Bolt or plate gave way at—	Total bulge of plate after rupture.	Remarks.
1.....	Inches. .5	Inches. 1.017	Inches. .920	Inches. Support was a hole 13" diameter in a heavy plate.	3—	Inches. Not riveted.	12	Inches. 3 1/2	Lbs. 36,085	Threads only projecting.	Lbs. 33,860	Inches. Not perceptible	Bolts pulled through, stripping threads in plate and bolt.
11.....	.5	1.017	.920	Same as above.	3—	do	12	do	28,400	do	do	do	This plate was supported the same as that below, with a plate (heavy) with 1 1/2" hole.
111.....	.5	1.017	.920			do	12		32,785				
Average	.5	1.017	.920				12		34,770	Ordinary thin conical head.	30,340	Not perceptible	Stay bolts broke between plates; they were riveted with thin head in the usual manner.
1.....	.5	1.020	.9		3—	1 1/2	12	3 1/2	34,980	do	34,980	do	The plate was supported by a heavy plate, in which was a hole 1 1/2" in diam., the stay-bolt passing through the hole to its place of attachment.
11.....	.5	1.020	.9		3—	1 1/2	12	3 1/2	35,033	do		do	Head of rivet was apparently uninjured.
111.....	.5	1.020	.9		3	1 1/2	12	3 1/2					
Average	.5	1.020	.9				12		22,650	Thread only projecting.	21,720	1 1/2	Bolts pulled through, stripping threads on bolt, and one-half of them in the plate.
1.....	.488	1.015	.919	4	Not riveted.	do	12	12,700	14,000	do	21,000	1 1/2	
11.....	.488	1.015	.919	4	do	do	12	14,000	do	do	21,000	1 1/2	
111.....	.488	1.015	.919	4	do	do	12	14,000	do	do	21,000	1 1/2	
Average	.488	1.015	.919	4			12	13,568			21,970	1 1/2	
1.....	.5	1.020	.9	4	3—	1 1/2	12	3 1/2	24,510	Ordinary thin conical head.	24,510	.39	1 and 14 threads injured; the bulge of the plate allowed the other threads of the bolt and the plate to clear each other, so as to leave them uninjured.
11.....	.5	1.020	.9	4	3—	1 1/2	12	1 1/2	24,830	do	24,830	.33	

TABLE A.—Experiments with screw stay-bolts, &c.—Continued.

Number and mark of specimens.	Thickness of boiler plate.	Diameter of stay-bolt outside of thread.	Diameter of stay-bolt inside of thread.	Distance from center to center of supporting bolts.	Number of threads left through for riveting.	Mean diameter of head after riveting.	Number of threads on bolts to the inch.	Thickness of rivet-head at crown.	Plate commenced to bulge at—	Kind of rivet-head.	Bolt or plate gave way at—	Total bulge of plate after rupture.	Remarks.
111	Inches. .5	Inches. 1.020	Inches. .9	Inches. 4	3—	Inches. 1½	12	Inches. ⅝	Lbs.	do	Lbs. Inches.		
Average	.5	1.020	.9	4	3	1.418	12	⅝	25,100		25,147	.373	
1	.504	1.016	.920	4	5+	1½	12	⅞	12,600	Button-head	32,775	⅞	Head stripped and bolt pulled through; threads left good in plate; slight cracks around hole.
11	.504	1.016	.920	4	5+	1½	12	⅞	13,000	do	33,000	⅞	Head and end of bolt torn off; all threads in plate injured; cracks in hole ⅞" long.
111	.504	1.016	.920	4	5+	1½	12	⅞	11,000	do	35,600	⅞	Head and part of thread on bolt stripped; thread in plate bolt slightly injured.
Average	.504	1.016	.920	4	5+	1.25	12	.4166	12,200		33,791.8	.625	
	.5	1.245	1.145	4	5+	1½	12	⅞	19,650	Button-head	38,900	⅞	Bolts pulled through; heads partly stripped; 2 threads left good in holes; cracks on opposite sides of holes ⅞" to ⅝" long.
	.498	1.245	1.145	4	5+	1½	12	⅞	18,575	do	35,900	⅞	
	.498	1.245	1.147	4	5+	1½	12	⅞	17,750	do	41,795	⅞	
Average	.4986	1.245	1.1456	4	5+	1.55238	12	.47916	18,658.6		38,895	.6666	
111	.503	1.020	.9	5	3 scant.	1½	12	⅝		Ordinary thin conical head.	23,125	.5	2 threads stripped; all the rest uninjured, the bulge of plate allowing them to clear each other.
1111	.503	1.020	.9	5	3 scant.	1½	12	⅝		do	21,310	.49	
11111	.503	1.020	.9	5	3 scant.	1½	12	⅝		do	21,975	.42	
Average	.503	1.020	.9	5	3	1½	12	⅝			22,137	.47	

TABLE A 1.

Iron plates and iron screw stay-bolts from No. 5 bar. Tensile strength of stays 56,683 pounds per square inch.

Number and marks on specimens.	Thickness of boiler plate.	Diameter of stay-bolt outside of thread.	Diameter of stay-bolt inside of thread.	Distance from center of support to center of stay-bolt.	Number of threads left for riveting.	Mean diameter of head after riveting.	Number of threads on bolt to the inch.	Thickness of rivet-head at the crown.	Plate commenced to bulge at—	Bulge of plate at double the strain at which commenced.	Bolt or plate gave way at—	Total bulge of plate after rupture.	Remarks.
Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Lbs.	Lbs.	Inches.	Inches.	
1..... 11..... 111.....	.250 .250 .250	.815 .815 .815	.750 .750 .750	4 4 4	5 5 5	1½ 1½ 1½	14 14 14	1½ 1½ 1½	4,150 4,500 4,100	2 2 2½	11,575 10,860 11,550	2 1½ 1½	Bolts pulled out, stripping head; two good threads left in holes; cracks on opposite side of hole ¾" long.
1..... 11..... 111.....	.360 .370 .368	.870 .870 .870	.708 .708 .708	4 4 4	5 5 5	1½ 1½ 1½	12 12 12	1½ 1½ 1½	5,850 5,150 6,000	2½ 2½ 2½	18,830 18,810 19,575	2½ 2½ 1½	Bolts pulled through; three good threads left in holes; cracked back on two sides of hole ½"; rivet-head stripped.
1..... 11..... 111.....	.498 .498 .490	1.010 1.010 1.010	.912 .912 .912	4 4 4	5 5 5	1½ 1½ 1½	12 12 12	1½ 1½ 1½	15,000 13,250 15,000	2½ 2½ 2½	26,000 26,250 24,075	2½ 2 1½	Head stripped; bolt pulled through; slight cracks in hole; threads left good in plate. Head and end of bolt torn off; all threads in hole injured; cracks around hole ½" back. Head and part of threads on bolt stripped; threads in hole slightly injured; cracked around hole.
1..... 11..... 111.....	.254 .254 .254	.818 .818 .818	.745 .745 .745	5 5 5	5 5 5	1½ 1½ 1½	14 14 14	1½ 1½ 1½	2,370 2,760 3,000	2½ 2½ 2½	11,910 12,625 12,910	2½ 2 1½	Bolts pulled out; two good threads left in hole; cracks on side of hole from ½" to ¾" long.

1	.870	.766	5	5	16	12	14	5,450	4	15,940	14	Heads stripped and bolts pulled out; three good threads left in hole; cracked back nearly 1" on opposite side of holes.
11	.870	.766	5	5	16	12	14	4,850	4	17,100	14	
111	.870	.766	5	5	16	12	14	4,725	4	17,730	14	
1	1	.912	5	5	14	12	14	11,000	14	33,860	14	Head stripped; bolts pulled out; 3 good threads left in hole; cracks on each side of hole $\frac{1}{2}$ " long.
11	.988	.912	5	5	14	12	14	9,350	14	32,210	14	Head stripped; bolts pulled out; 3 good threads left in hole; cracks all around hole $\frac{1}{2}$ " to $\frac{3}{4}$ " long.
111	.988	.912	5	5	14	12	14	13,400	14	33,675	14	

All stay bolts in this table were screwed and riveted over heads formed with button-head set.



TABLE A 2.

Iron plates and iron screw stay-bolts from bar No. —. Tensile strength, 56,983 pounds, with increased size of stay-bolts.

Number and marks on specimens.	Thickness of boiler plate.	Diameter of stay-bolt outside of thread.	Diameter of stay-bolt inside of thread.	Distance from center to center of supporting bolts.	Number of threads left for riveting.	Mean diameter of head after riveting.	Number of threads on bolt to the inch.	Thickness of rivet-head at the crown.	Plate commenced to bulge at—	Bulge of plates at double the strain at which commenced.	Bolt or plate gave way at—	Total bulge of plate after rupture.	Remarks.
Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Lbs.	Inches.	Lbs.	Inches.	
1....	$\frac{1}{2}$ 250	1.004	.945	4	5	1 $\frac{1}{2}$	14	$\frac{11}{16}$	3,600	$\frac{7}{16}$	13,940	$\frac{11}{16}$	Bolts pulled through; heads partly stripped; all threads in hole slightly injured; small cracks around hole.
11....	$\frac{1}{2}$ 247	1.004	.942	4	5	1 $\frac{1}{2}$	14	$\frac{11}{16}$	3,000	$\frac{7}{16}$	13,460	$\frac{11}{16}$	
111....	$\frac{1}{2}$ 245	1.004	.940	4	5	1 $\frac{1}{2}$	14	$\frac{11}{16}$	3,250	$\frac{7}{16}$	12,675	$\frac{11}{16}$	
1....	$\frac{1}{2}$ 268	1.150	1.058	4	5	1 $\frac{1}{2}$	12	$\frac{7}{16}$	9,500	$\frac{7}{16}$	21,420	$\frac{11}{16}$	
11....	$\frac{1}{2}$ 274	1.150	1.057	4	5	1 $\frac{1}{2}$	12	$\frac{7}{16}$	12,000 (*)	(*)	20,950	$\frac{11}{16}$	Bolts pulled through; heads partly stripped; threads left good in hole; cracks on opposite sides of holes from $\frac{1}{4}$ " to $\frac{1}{2}$ " long.
111....	$\frac{1}{2}$ 277	1.150	1.057	4	5	1 $\frac{1}{2}$	12	$\frac{7}{16}$	11,550	$\frac{1}{2}$	23,475	$\frac{7}{16}$	
1....	$\frac{1}{2}$ 290	1.245	1.145	4	5	1 $\frac{1}{2}$	12	$\frac{1}{2}$	16,960	$\frac{11}{16}$	38,960	$\frac{1}{2}$	
11....	$\frac{1}{2}$ 296	1.245	1.145	4	5	1 $\frac{1}{2}$	12	$\frac{11}{16}$	18,575	(*)	35,900	$\frac{11}{16}$	Bolts pulled through; heads partly stripped; threads left good in hole; threads on bolt but little injured; small cracks around hole, $\frac{1}{4}$ " to $\frac{1}{2}$ " long.
111....	$\frac{1}{2}$ 298	1.245	1.147	4	5	1 $\frac{1}{2}$	12	$\frac{11}{16}$	17,750	$\frac{11}{16}$	41,785	$\frac{11}{16}$	
1....	$\frac{1}{2}$ 253	1.003	.945	5	5	1 $\frac{1}{2}$	14	$\frac{11}{16}$	2,500	$\frac{1}{2}$	12,850	$\frac{1}{2}$	
11....	$\frac{1}{2}$ 258	1.003	.941	5	5	1 $\frac{1}{2}$	14	$\frac{11}{16}$	2,375	$\frac{1}{2}$	12,900	$\frac{1}{2}$	Bolts pulled through; heads partly stripped; two threads left good in holes; cracks on opposite sides of hole $\frac{1}{4}$ " to $\frac{1}{2}$ " long.
111....	$\frac{1}{2}$ 260	1.004	.939	5	5	1 $\frac{1}{2}$	14	$\frac{11}{16}$	2,350	$\frac{1}{2}$	11,940	$\frac{11}{16}$	

1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
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(*) Strain not reached.

All stay-bolts in this table were screwed and riveted on; heads formed with a button-head set.

TABLE A 3.

Iron plates and iron screw stay-bolts from plate No. 1 bar. Tensile strength, 54,498 pounds per square inch.

Number and mark on specimen.	Thickness of boiler plate.	Diameter of stay-bolt outside of thread.	Diameter of stay-bolt inside of thread.	Distance from center to center of supporting bolts.	Number of threads left for riveting.	Mean diameter of head after riveting.	Number of threads on bolt to the inch.	Thickness of rivet-head at crown.	Plate bulged at—	Bolt or plate gave way at—	Total bulge of plate after rupture.	Remarks.
1.....	Inches. .201	.828	.738	Inches. 5	5	Inches. 1½	14	Inches. ½	Lbs. 8,970	Lbs. 13,425	Inches. ½	Bolt pulled through plate. The bulging of the plate left two threads uninjured. No cracks in plate.
1 1 .....	.201	.829	.738	5	5	1½	14	½	.....	9,900	½	
1 1 1 .....	.201	.829	.738	5	5	1½	14	½	.....	.....	.....	Do.
1.....	.277	.872	.770	5	5	1½	12	½	.....	14,880	½	
1 1 .....	.378	.872	.770	5	5	1½	12	½	.....	11,960	½	
1 1 1 .....	.276	.872	.770	5	5	1½	12	½	.....	15,630	½	
1.....	.3115	1.020	.917	5	5	1½	12	½	.....	18,950	½	
1 1 .....	.3115	1.020	.917	5	5	1½	12	½	.....	18,050	½	Bolt pulled through plate. Same as above, except that three threads were left uninjured.
1 1 1 .....	.3110	1.020	.917	5	5	1½	12	½	.....	18,000	½	
1.....	.195	.828	.737	4	5	1½	14	½	2,600	10,680	½	Bolt pulled through plate. Same as above, except two threads left uninjured.
1 1 .....	.202	.828	.737	4	5	1½	14	½	3,500	11,350	½	
1 1 1 .....	.196	.828	.737	4	5	1½	14	½	.....	11,610	½	
1.....	.25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Were unable to find in the yard any more ¼" steel plates of the same quality as the other.
1 1 .....	.25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1 1 1 .....	.25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1.....	.303	1.015	.919	4	5	1½	12	½	8,000	22,300	½	Bolt pulled through plate. The bulging of the plate left two threads uninjured.
1 1 .....	.3038	1.015	.919	4	5	1½	12	½	8,500	21,000	½	
1 1 1 .....	.304	1.015	.919	4	5	1½	12	½	8,600	20,700	½	

All of stay bolts in this table were screwed and riveted over; the head being formed with a button head set.

TABLE II.
Iron boiler plate and copper screw stay-bolts.

Number and mark on specimen.	Thickness of boiler-plate.	Diameter of stay-bolt outside of thread.	Diameter of stay-bolt inside of thread.	Distance from center to center of supporting bolts.	Number of threads left for riveting.	Mean diameter of head after riveting.	Number of threads on bolt to the inch.	Thickness of rivet-head at crown.	Plate commenced to bulge at—	Bolt or plate gave way at—	Total bulge of plate after rupture.	Remarks.
1.....	Inches. .280	.816	.736	4	6	1 1/4	14	1/2	6,450	11,950	Inches. 1 1/2	Bolts pulled through; all the threads somewhat injured; plates cracked in two places on opposite sides of the hole.
11.....	.288	.816	.738	4	6	1 1/4	14	1/2	6,000	12,580	1	
111.....	.288	.816	.736	4	6	1 1/4	14	1/2	6,000	12,680	1	
1.....	.382	.822	.738	4	6	1 1/4	14	1/2	8,000	16,640	1	Bolts pulled through; rivet head pulled off in shape of a ring; where it lapped over the plate slight cracks around holes; two to three threads injured in plate. On No. 111 bolt, all threads were stripped and all but three in the plate.
11.....	.384	.821	.736	4	6	1 1/4	14	1/2	9,000	17,930	1 1/2	
111.....	.382	.822	.736	4	6	1 1/4	14	1/2	10,000	16,870	1 1/2	
1.....	.479	.859	.766	4	6	1 1/2	12	1/2	14,000	22,595	2 1/2	Bolt broke; ends left loose in hole; rivet head but little injured. Bolt pulled out, leaving head and threads stripped; one thread in plate uninjured.
11.....	.479	.859	.766	4	6	1 1/2	12	1/2	14,000	22,380	1 1/2	
111.....	.480	.859	.766	4	6	1 1/2	12	1/2	14,500	22,795	1 1/2	
1.....	.505	1.012	.908	4	6	1 1/2	12	1/2	15,000	28,380	1	Bolt pulled out, stripping head and threads; only one thread in plate uninjured. Bolt pulled out, stripping head and threads; threads in plate but little injured. Bolt broke leaving ends tight in plate.
11.....	.510	1.012	.908	4	6	1 1/2	12	1/2	15,600	28,435	1	
111.....	.510	1.012	.908	4	6	1 1/2	12	1/2	16,700	28,560	1 1/2	

All stay-bolts in this table were screwed and riveted over; the heads being formed with a button-head set.

TABLE B1.

Iron boiler-plates and copper screw stay-bolts.

Number and marks on specimens.	Thickness of boiler-plate.	Diameter of stay-bolt outside of thread.	Diameter of stay-bolt inside of thread.	Distance from center to center of supporting bolts.	Number of threads left for riveting.	Mean diameter of head after riveting.	Number of threads on bolt to the inch.	Thickness of rivet-head at the crown.	Plate commenced to bulge at—	Bulge of plate at double the strain at which commenced.	Bolt or plate gave way at—	Total bulge of plate after rupture.	Remarks.
	Inches.	Inches.	Inches.	Inches.		Inches.		Inches.	Lbs.	Inches.	Lbs.	Inches.	
1.....	$\frac{1}{2}$.248	.820	.747	4	5	$\frac{1}{2}$	14	$\frac{1}{2}$	3,800	$\frac{1}{2}$	11,850	$\frac{1}{2}$	Heads stripped; bolt pulled out; 2 good threads left in plate; crack $\frac{1}{2}$ " on one side of hole.
11.....	$\frac{1}{2}$.248	.820	.747	4	5	$\frac{1}{2}$	14	$\frac{1}{2}$	4,000	$\frac{1}{2}$	11,610	$\frac{1}{2}$	Same as above, except crack $\frac{1}{2}$ " on each side of hole.
111.....	$\frac{1}{2}$.252	.820	.747	4	5	$\frac{1}{2}$	14	$\frac{1}{2}$	4,050	$\frac{1}{2}$	11,650	$\frac{1}{2}$	Same as above, except crack $\frac{1}{2}$ " on both sides of hole.
1.....	$\frac{1}{2}$.370	.874	.770	4	5	$\frac{1}{2}$	12	$\frac{1}{2}$	5,700	$\frac{1}{2}$	17,415	$\frac{1}{2}$	Three good threads left in plate; bolt pulled through; cracked $\frac{1}{2}$ " on two sides of hole.
11.....	$\frac{1}{2}$.368	.874	.770	4	5	$\frac{1}{2}$	12	$\frac{1}{2}$	5,690	$\frac{1}{2}$	18,000	$\frac{1}{2}$	Same as above, except cracked $\frac{1}{2}$ " on two sides of hole.
111.....	$\frac{1}{2}$.369	.874	.770	4	5	$\frac{1}{2}$	12	$\frac{1}{2}$	6,000	$\frac{1}{2}$	18,475	$\frac{1}{2}$	Same as above, except cracked $\frac{1}{2}$ " on two sides of hole.
1.....	$\frac{1}{2}$.495	1.014	.908	4	5	1 $\frac{1}{2}$	12	$\frac{1}{2}$	12,500	$\frac{1}{2}$	29,545	$\frac{1}{2}$	No cracks around hole; head and thread stripped on bolt; threads in plate good.
11.....	$\frac{1}{2}$.497	1.014	.908	4	5	1 $\frac{1}{2}$	12	1 $\frac{1}{2}$	13,500	$\frac{1}{2}$	29,265	$\frac{1}{2}$	
111.....	$\frac{1}{2}$.500	1.014	.908	4	5	1 $\frac{1}{2}$	12	$\frac{1}{2}$	14,000	$\frac{1}{2}$	28,875	$\frac{1}{2}$	
1.....	$\frac{1}{2}$.550	.817	.747	5	5	1 $\frac{1}{2}$	14	$\frac{1}{2}$	2,750	$\frac{1}{2}$	9,960	$\frac{1}{2}$	Head and thread stripped and bolts pulled through; $\frac{1}{2}$ " cracks on two sides of hole.
11.....	$\frac{1}{2}$.248	.817	.747	5	5	1 $\frac{1}{2}$	14	$\frac{1}{2}$	3,915	$\frac{1}{2}$	11,100	$\frac{1}{2}$	Same as above, except $\frac{1}{2}$ " crack on two sides of hole.
111.....	$\frac{1}{2}$.251	.817	.747	5	5	1 $\frac{1}{2}$	14	$\frac{1}{2}$	3,000	$\frac{1}{2}$	10,900	$\frac{1}{2}$	Same as above, except $\frac{1}{2}$ " crack on two sides of hole.

1	.872	.770	5	5	1 1/2	12	4	4,500	17,520	1 1/2	Head and threads stripped and pulled through; 3 threads left in plate; 1/4" cracks on two sides of hole.
11	.873	.770	5	5	1 1/2	12	4	5,000	18,410	1 1/2	Same as above, except small cracks all around hole.
111	.872	.770	5	5	1 1/2	12	4 1/2	5,500	17,365	1	Same as above, except 1/4" cracks on two sides of hole.
1	1.012	.908	5	5	1 1/2	12	4 1/2	14,650	28,000	1 1/2	Head and threads stripped and bolt pulled through; threads in plate uninjured; cracks all around hole.
11	1.012	.908	5	5	1 1/2	12	4 1/2	14,500	28,350	1	Bolt broke.
111	1.012	.908	5	5	1 1/2	12	4 1/2	15,000	28,100	1	Same as first, except cracks around hole from 1/4" to 1".

* Strain not reached.

All stay-bolts in this table were screwed and riveted; over heads formed with button-head set.

TABLE C.
Copper plates and iron screw stay-bolts from bar No. 5. Tensile strength, 56,683 pounds per square inch.

Number and mark on specimen.	Thickness of boiler-plate.	Diameter of stay-bolt outside of thread.	Diameter of stay-bolt inside of thread.	Distance from center to center of supporting bolts.	Number of threads left through for riveting.	Mean diameter of head after riveting.	Number of threads on bolt to the inch.	Thickness of rivet-head at the crown.	Plate commenced to bulge at—	Bolt or plate gave way at—	Total bulge of plate after rupture.	Remarks.
	Inches.	Inches.	Inches.	Inches.		Inches.		Inches.	Lbs.	Lbs.	Inches.	
1.....	.242	.830	.745	4	5	1½	14	¾	2,000	7,210	¾	Heads pulled off and bolts pulled out, leaving threads in plate and on bolt but little injured, cracks in plates, back about ¼" from edge of holes.
11.....	.248	.830	.745	4	5	1½	14	¾	1,800	8,040	1½	
111.....	.240	.830	.745	4	5	1½	14	¾	1,900	7,550	1½	
1.....	.373	.830	.744	4	5	1½	14	1½	6,000	12,400	1	Same as above, except cracks on opposite sides of hole, ¼" back.
11.....	.373	.830	.744	4	5	1½	14	1½	5,500	11,240	1	
111.....	.373	.830	.744	4	5	1½	14	1½	5,000	11,850	1½	Same as above, except cracked slightly all around the hole.
1.....	.428	.877	.768	4	5	1½	12	1½	7,350	14,950	1½	Same as above, except no cracks around the hole.
11.....	.428	.877	.768	4	5	1½	12	1	6,750	14,075	1	
111.....	.428	.877	.768	4	5	1½	12	1½	6,500	14,410	1	Same as above, except slight cracks all around the hole.

1	.485	1.020	.008	4	5	14	12	10	7,000	15,000	50	Bolt pulled out, leaving all the threads on bolt and in plate; good; slight cracks around hole.
11	.490	1.030	.008	4	5	14	12	10	8,000	16,000	2	Same as above, except two cracks on opposite sides of hole.
111	.495	1.030	.008	4	5	14	12	10	8,000	20,400	2	Same as above, except slight cracks all around the hole.

All the stay-bolts in this table were screwed in and riveted over, the heads being formed with a button-head set.

TABLE C1.

Copper boiler-plates; iron screw stay-bolts (bolts from No. 5 bar). Tensile strength, 56,683 pounds per square inch.

Number and mark on specimen.	Thickness of boiler-plate.	Diameter of stay-bolt outside of thread.	Diameter of stay-bolt inside of thread.	Distance from center to center of supporting bolts.	Number of threads left for riveting.	Mean diameter of head after riveting.	Number of threads on bolt to the inch.	Thickness of rivet-head at the crown.	Plate commenced to bulge at—	Bulge of plate at which the strain at double commenced.	Bolt or plate gave way at—	Total bulge of plate after rupture.	Remarks.
	Inches.	Inches.	Inches.	Inches.		Inches.		Inches.	Lbs.	Inches.	Lbs.	Inches.	
1....	.255	.828	.746	4	5	1½	14	1	3,800	1½	8,940	1½	Bolt pulled out; head slightly stripped; threads in hole slightly injured; cracks from ⅝" to ⅞" around hole.
11....	.255	.828	.746	4	5	1½	14	1½	3,355	1	8,560	1½	
111....	.255	.828	.746	4	5	1½	14	1½	3,620	1½	9,110	1	
1....	.275	.879	.788	4	5	1½	12	1½	6,240	1½	13,800	1½	Bolts pulled out; head partly stripped; threads in hole damaged; cracked around hole from ⅝" to ⅞" back.
11....	.275	.879	.788	4	5	1½	12	1	5,700	1½	12,655	1	
111....	.275	.879	.788	4	5	1½	12	1	6,400	1½	13,410	1½	
1....	.501	1.006	.912	4	5	1½	12	2½	12,200	2½	19,310	1	Bolts pulled through; head partly stripped; threads in hole damaged; small cracks all around hole of 1 1 1 plate; no cracks in the others.
11....	.501	1.006	.912	4	5	1½	12	2½	11,975	2½	20,310	1½	
111....	.501	1.006	.912	4	5	1½	12	1½	12,200	2½	20,425	1½	
1....	.267	.827	.749	5	5	1½	14	1½	2,500	1	7,115	1	Bolt pulled out; stripped but little of head, but none of threads on bolt; plate cracked ⅝" on each side of hole.
11....	.267	.827	.749	5	5	1½	14	1½	2,350	1½	6,855	1	Head stripped and thread slightly injured on bolt; small cracks around hole.
111....	.267	.827	.749	5	5	1½	14	1½	2,000	1½	8,000	1½	

		.844	.791	5	5	1½	12	8	5,300	11	12,825	1	Bolts pulled through; head partly stripped; threads in hole damaged; small cracks around holes in I and I I plates; no crack in I I plate.
I.....	.540	.844	.791	5	5	1½	12	8	5,300	11	12,825	1	
II.....	.580	.884	.791	5	5	1½	12	10	4,875	9	13,140	2	
III.....	.580	.884	.791	5	5	1½	12	8	5,315	11	13,205	11	
I.....	.502	1.005	.923	5	5	1½	12	11	8,750	11	19,000	11	Bolts pulled through; head partly stripped; threads in hole damaged; no cracks around holes.
II.....	.502	1.005	.923	5	5	1½	12	15	8,350	8	19,800	2	
III.....	.502	1.005	.923	5	5	1½	12	15	8,400	11	19,800	11	

All stay-bolts in this table were screwed and riveted over; heads formed with button-head set.

TABLE D.
Copper plates and copper screw stay-bolts.

Number and marks on specimens.	Thickness of boiler plate.	Diameter of stay-bolt outside of thread.	Diameter of stay-bolt inside of thread.	Distance from center to center of supporting bolts.	Number of threads left for riveting.	Mean diameter of head after riveting.	Number of threads on bolt to the inch.	Thickness of rivet-head at the crown.	Plate commenced to bulge at—	Bulge of plate at double the strain at which commenced.	Bolt or plate gave way at—	Total bulge of plate after rupture.	Remarks.
Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Lbs.	Inches.	Lbs.	I ^a .	
1.....	.244	.885	.745	4	5	1½	14	4	2,000	.....	7,900	3½	{ Bolts pulled out stripping part of head, and leaving threads in hole uninjured; slight cracks around holes.
11.....	.241	.825	.745	4	5	1½	14	4	2,000	.....	7,875	3½	
111..	.250	.825	.745	4	5	1½	14	4½	1,800	.....	7,750	3½	
1.....	.373	.828	.746	4	5	1½	14	3½	3,750	.....	11,375	3½	{ Bolts pulled out, head stripped off; all threads in hole injured; slight cracks around hole.
11.....	.373	.828	.746	4	5	1½	14	3½	4,000	.....	11,000	3½	{ Same as above, except no cracks around hole.
111..	.373	.828	.746	4	5	1½	14	3½	4,500	.....	11,425	4	
1.....	.419	.878	.767	4	5	1½	12	4	6,550	.....	13,525	3½	{ Bolts pulled out, heads stripped; all threads in hole left good; no cracks around hole.
11.....	.423	.878	.767	4	5	1½	12	4½	5,150	.....	14,100	4	{ Same as above, except slight cracks around hole.
111..	.425	.878	.767	4	5	1½	12	4½	6,000	.....	14,125	3½	
1.....	.501	1.010	.907	4	5	1½	12	4½	7,650	.....	19,900	3½	{ Bolts pulled through, heads stripped; all threads left good in hole but one; crack around hole.
11.....	.663	1.010	.907	4	5	1½	12	4½	8,000	.....	17,750	3½	
111..	.504	1.010	.907	4	5	1½	12	4½	9,000	.....	19,275	3½	

Steel plate and iron bolts No. 11111 bar. Tensile strength of stays 56,083. Stays riveted with button-heads.

Number and marks on specimens.	Thickness of boiler plate.	Diameter of stay-bolt outside of thread.	Diameter of stay-bolt inside of thread.	Distance from center to center of supporting bolts.	Number of threads left for riveting.	Mean diameter of head after riveting.	Number of threads on bolt to the inch.	Thickness of rivet-head at the crown.	Plate commenced to bulge at—	Bulge of plate at double the strain at which commenced.	Bolt or plate gave way at—	Total bulge of plate after rupture.	Remarks.
Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Lbs.	Inches.	Lbs.	I ^a .	
1.....	.251	.885	.765	4	5	1½	14	4	4,900	4½	15,820	4	{ Heads stripped; bolts pulled through, threads left good in hole; no cracks around hole.
11.....	.249	.820	.745	4	5	1½	14	4	4,500	4½	17,515	4½	
111..	.249	.820	.745	4	5	1½	14	4	4,000	4½	16,575	4½	

[illegible]

All bolts in this table were screwed and riveted over, the heads being formed with a button-head set.

APPENDIX B.

WASHINGTON, D. C., November 24, 1879.

SIR: In obedience to the orders of the Bureau of Steam Engineering to conduct a series of experiments, "the object being to ascertain the proper proportions for the ends of boiler-braces," I respectfully submit, as complying with the instructions conveyed in the orders, tables A, B, and C, with sketches illustrating the same.

The tests were carefully made and the measurement accurately taken. In fact every precaution was taken to insure reliable results for comparison. Three specimens of each dimension were prepared and tested; all pins were accurately fitted, and were secured in place by a head on one end and a nut on the other. Where steel pins were used it is noted in the tables; from the results of the experiments of others it was not deemed necessary to commence these trials with pins whose diameter was much less than .65 of the width of the *proposed bar*.

As the proportions of the crown and the sides of the eye were first sought after, no care was taken to proportion the shank until these had been closely approximated, it being an easy matter to calculate what the dimensions of the bar should be when the strength developed by the eye was known, after which three specimens were made in accordance therewith, and tested for verifying the deductions.

The first series of experiments, marked W, 1 W, 2 W, 3 W, were made with eyes formed by drawing out the bar under the hammer, bending and welding it around a mandrel slightly smaller than the pin, then reaming out the hole to fit; the rest was finished to size in a shaping-machine.

A careful examination of these tests show the uncertainty attending the use of boiler-braces made in this manner; first, owing to the fact that it is impossible to know when the weld is perfect. Notwithstanding every precaution has been taken to secure this result, 25 per cent. of these having broken in the weld. Of the two specimens marked 1 W, which parted in the weld, one gave out at 9,260 pounds less than the other, although the workmanship was as nearly the same in all as it was possible to make it, and the material from the same bar; besides, after being welded, the surfaces were planed and finished, and during as well as after each process they were carefully examined without the discovery of any apparent defects in the welding.

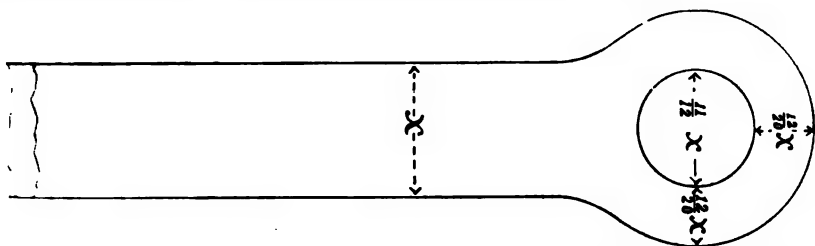
Attention is also called to the irregularity in the breaking-strength of the eyes made from the same bar, and which broke in the side of the eye, the weld being perfect, the difference between the highest and the lowest in trials 3 W being 4,760 pounds, although made as nearly in the same manner as it was possible, and breaking in the same part of the eye. In 2 W, under the same circumstances, the difference was 1,450 pounds, and in trials marked 1 W, one specimen broke through the side of the eye at 2,330 pounds less than the weld gave out in another.

It would seem that the high heat to which the iron had to be brought in order to weld it, and the subsequent working, had somewhat impaired the quality of the iron.

These specimens marked 2 W_a were prepared from deductions derived from the other tests with the intention of having uniform strength in all parts. By examination of the data it will be seen that in the first the side of the eye gave out at 518 pounds in excess of the *calculated* strength of the shank; and the shank was very much distressed and seemed just on the point of giving way; in the second, the side of the

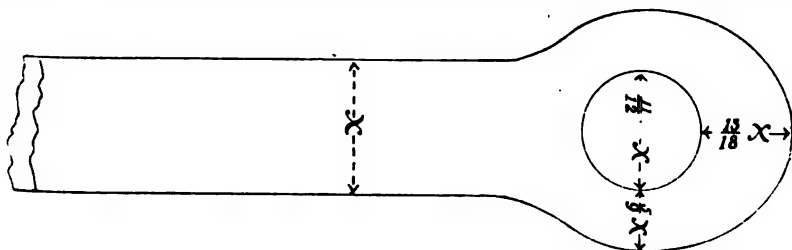
eye gave way at 1,912 pounds less than the estimated strength of the shank; in the third, the weld gave out at 1,867 pounds less. In these specimens depth of the crown of the eye was $\frac{1}{4}$ " and the breadth of one side of the eye was $\frac{1}{2}$ " which was $\frac{1}{4}$ " less than in the first tests; if the sides of the eye had been concentric with the crown, there can be no doubt but that, with the exception of the one which gave out in the weld, the shank would have yielded first, or have been at the point of yielding, at the same time as the eye.

The following proportions are submitted, as those which will give nearly a uniform strength in the eye, slightly in excess of that of the shank, supposing the weld to be perfect and the quality of the iron not to be materially affected in welding and working, these proportions will apply until the thickness of the bar is equal to its breadth.



With a steel pin of proper tensile strength its diameter can be reduced to .65 of the breadth of the bar with the same results.

The experiments marked from 1 to 6 were made upon eyes cut from the flat bar without forging. By examination it will be seen that the proportions given below are such as will approximate in this case as nearly as possible to a uniform strength in all parts, the thickness of the eye and the bar remaining the same; in practice, however, a small amount should be added to the proportionate dimensions given to the eye and pin to compensate for wear, compression, &c.; besides, it is desirable to have the strength of the eye exceed, to some extent, that of the bar. These proportions will apply until the thickness of the bar is equal to its breadth. With a steel pin the diameter can be reduced as stated above.



The following is given as an example of the dimensions the preceding proportions will give for an eye to be *equal* in strength to a $1\frac{1}{8}$ " x $1\frac{1}{8}$ " bar, the eye to be of the same thickness as the bar: Breadth of one side of the eye, $\frac{5}{8}$ "; depth of crown of eye, $\frac{1}{2}$ "; diameter of iron pin, $\frac{3}{4}$ "; diameter of steel pin, $\frac{1}{2}$ "; the areas of the above being as follows: Of bar, 1.265625 \square ; of iron pin, .83529 \square (of steel pin, .42327 \square); of section of one side of eye, .703125 \square ; of section through the crown of eye, .91406 \square . Assuming the tensile strength of the iron from which the bar was made to be 48,327 pounds per square inch, the strength of the brace would be 61,147 pounds; in a boiler brace the pin has a double shear, and as

recent experiments have shown that the average shearing strength is about 24 per cent. of the tensile strength, it is evident that a $\frac{1}{16}$ " steel pin of 70,000 pounds tensile strength would be more than sufficient, or a $\frac{3}{32}$ " iron pin of the same tensile strength as the bar would slightly exceed the strength of the bar.

From deductions derived from the above experiments, specimens marked 4 a were made, in which the relative proportions of the eye and pin were slightly increased, in order to insure an excess of strength in the eye as well as to allow for wear, &c. As anticipated the eye bars broke in the shank. The thickness of eye and bar were the same; their relative proportions otherwise were as follows: x = width of bar; $\frac{1}{2}x$ = breadth of side of eye; $\frac{1}{2}x$ = depth through crown of eye; $\frac{1}{2}x$ = diameter of pin (steel).

Experiments marked 1 X, 2 X, 3 X, and 4 X were made, increasing the diameter of the pin from $\frac{1}{16}$ " to $\frac{3}{16}$ "; comparing a mean of trials 2 and 2 X will show a slight gain in strength of the eye with the $\frac{3}{16}$ " pin; comparing 3 and 3 X, 4 and 4 X, a slight loss is shown; in the cases of 3 X and 4 X the side of the eye was $\frac{1}{16}$ " wider than in trials 3 and 4, so that the gain in one case is more than counter balanced by the loss in the other.

Experiments 1 Y, 2 Y, 3 Y, and 4 Y were made to see what the effect would be by increasing the size of the pin, the other dimensions remaining the same in each case; the diameter of the pins being 1", $1\frac{1}{4}$ ", $1\frac{3}{8}$ ", and $1\frac{1}{2}$ "; the eye being concentric, $\frac{3}{8}$ " wide and $\frac{1}{2}$ " thick; with the 1" pin one eye broke through the lower quarter, and two broke through the crown, with an average strain of 23,122 pounds; with the $1\frac{1}{4}$ " pin all three broke through the crown of the eye, with an average strain of 23,473 pounds; with the $1\frac{3}{8}$ " pin all three of the eyes broke through the crown, with an average strain of 23,193 pounds; and with the $1\frac{1}{2}$ " pin all three broke through the lower quarters of the eye, with an average strain of 21,812 pounds. It will be observed that between the first three (1 Y, 2 Y, and 3 Y) there was but a slight difference in strength, which might be due to inequalities occurring in the same bar; also, that the points of rupture were, all but one, in the crown of the eye, while in the last (4 Y) the points of rupture were all in the lower quarters of the eye, with a considerable diminution in strength; showing that the strains producing rupture with the $1\frac{1}{2}$ " pin were acting under different conditions to those producing rupture with the other, thus indicating the necessity of special proportions for different sized eyes for the same bar, dependent upon each material change in the diameter of the pin.

Three specimens marked 4 L were prepared with the intention that the proportions of the eye should be such that the strength of the eye should be slightly in excess of that of the bar; these differed from the proportions determined upon for 4 A in two points: the pin was of iron of same quality as the bar, 1" instead of $\frac{1}{16}$ " in diameter, and the depth through the crown was $\frac{3}{8}$ " instead of $\frac{1}{16}$ ". It will be noticed that the relative results obtained were the same.

Specimens for experiments A 1, 2, and 3, B 1, 2, and 3, C 1, 2, and 3 (Table C and Plate M), were made from bars slightly larger than the required size; the eye was formed (solid) by upsetting the end of the bar and forging to the required shape; the eye and bar were brought as nearly as possible to given dimensions in the lathe and planer; the hole in the eye was drilled and the pin made to fit easily, but not loose.

Specimens A 3, B 3, C 3, were prepared with the intention that the strength of the eye should be sufficiently in excess to ensure the break

ing of the bar in all cases, which result was obtained, the eye showing only very moderate signs of distress after rupture of the bar.

As it was thought best that in practice the proportions of the eye should be such that it should show only very slight signs of distress after a strain sufficient to rupture the bar, specimens A 2 and 1, B 2 and 1, C 2 and 1, were prepared at the same time, in case the eyes of A 3, &c., should give way, or should show greater distress than desirable.

In specimens A 2, B 2, C 2, the effects of the strain were so slight that it was hardly perceptible; and in A 1, B 1, C 1, it was not perceptible to the eye.

The following are the relative proportions of A 3 (thickness of eye equal to diameter of bar): x = area of the bar, $1.46x$ = area of section across the eye, $.73x$ = section through crown of eye, x = area of pin.

In specimens B the proportionate size of the pin was materially increased without a proportionate increase in the proportions of the eye; consequently greater comparative distress was shown in the eyes than in those of A and C. The various experiments suggested many things that would have been both interesting and instructive to have examined further, but other duties and limited time prevented extending the investigation beyond the original limits as far as desired.

The following is submitted for the proportions (with sufficient excess in the eye for wear, &c.) of the ends of boiler braces made in the manner specified. In the same bar, the section across the eye must be increased with each material increase of the diameter of the pin. When the brace is round and the thickness of the eye and the diameter of the bar are equal, let x = areas.

For ends made by drawing out the bar, bending it around and welding: x = width of bar and the diameter of iron pin, $\frac{1}{2}x$ = diameter of steel pin, $\frac{2}{3}x$ = breadth of (concentric) eye, thickness of eye to equal that of bar.

For ends cut from flat bars, x = width of bar and diameter of iron pin, $\frac{1}{2}x$ = diameter of steel pin, $\frac{3}{4}x$ = breadth across each side of eye, $\frac{7}{8}x$ = depth through crown of eye, thickness of eye = that of bar.

For ends upset, and forged solid, holes drilled, x = area of bar and area of iron pin, $1.48x$ = area of section across the eye, $.9x$ = area through crown of eye.

Respectfully submitted,

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GEORGE E. TOWER,
Passed Assistant Engineer, U. S. N.

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TABLE A.—*Test made to determine the proper dimensions of pins, eyes, and shanks of boiler braces, to insure equal strength throughout.*

Those specimens, made without forging, were cut from 2½" by ½" flat bar iron, planed smooth on both sides, brought to the proper thickness, and the holes reamed to fit the pins accurately; they were then put on mandrels and cut out to the required form in the shaping-machine. In making those with welded eyes, the pieces were first drawn out and bent and welded over a mandrel which was one-eighth inch less in diameter than the finished holes.

Mark on specimen.	Tensile strength of bar from which made.	Pins.	Eye of brace.				Shank of brace.				Specimens.		Remarks.			
			Steel or iron.	Diameter.	How made.	Outside diameter.	Thickness.	Depth from crown	Sectional area at sides of hole.	Sectional area at crown.	Breadth.	Thickness.		Area.	Calculated strength.	Broke at—	Mean of three breaks.	Kelongation between centers of holes.
	Per sq. inch.	In.		In.		In.	In.	In.	In.	In.	In.	In.	Lbs.	Lbs.	In.	
W	45,267	Steel	.8875	1.946	Bar bent over and welded.	.503	.6330	.2842	1.255	.503	0.6313	28,577	28,100	.7000	Broke through upper quarters of hole for pin; shank stretched ¼ inch.	
W	45,267	Steel	.8875	1.946		.503	.6330	.2842	1.255	.503	0.6313	28,577	25,350	.7000	Do.	
W	45,267	Steel	.8875	1.946		.503	.6330	.2842	1.255	.503	0.6313	28,577	25,900	.7000	Do.	
1 W	45,267	Steel	.8875	1.936	Bar bent over and welded.	.504	.6322	.3150	1.25	.504	0.6300	28,518	19,520	.2500	Broke through weld, one-third of which was imperfect.	
1 W	45,267	Steel	.8875	1.936		.504	.6322	.3150	1.25	.504	0.6300	28,518	26,450	.8875	Broke through upper quarter of eye.	
1 W	45,267	Steel	.8875	1.936		.504	.6322	.3150	1.25	.504	0.6300	28,518	28,790	.6250	Broke through weld, one-fourth of which was imperfect.	
2 W	48,478	Steel	.8875	1.94	Bar bent over and welded.	.504	.6312	.3503	1.25	.504	0.6300	30,541	28,475	.6875	Broke across the eye; cracked on both sides of hole.	
2 W	48,478	Steel	.8875	1.94		.504	.6312	.3503	1.25	.504	0.6300	30,541	28,765	.7375	Do.	
2 W	48,478	Steel	.8875	1.94		.504	.6312	.3503	1.25	.504	0.6300	30,541	29,925	.8875	Do.	
3 W	48,827	Steel	.8875	1.94	Bar bent over and welded.	.501	.753	.6275	1.256	.502	0.6305	30,470	28,210	.6300	Broke through sides of eye.	
3 W	48,827	Steel	.8875	1.94		.501	.753	.6275	1.256	.502	0.6305	30,470	30,535	.8600	Do.	
3 W	48,827	Steel	.8875	1.94		.501	.753	.6275	1.256	.502	0.6305	30,470	26,775	.5000	Do.	
2 W a.	48,478	Steel	.8875	1.868	Bar bent over and welded.	.506	.661	.5973	1.185	.506	0.5906	28,067	29,585	.7500	Broke through sides of eye; bar showed signs of giving away.	
2 W a.	48,478	Steel	.8875	1.868		.506	.661	.5973	1.185	.506	0.5906	28,067	27,155	.5300	Do.	
2 W a.	48,478	Steel	.8875	1.868		.506	.661	.5973	1.185	.506	0.5906	28,067	27,200	.6500	Broke through weld; cracked on sides of hole.	
1	45,267	Steel	.8875	1.9375	Cut out from bar.	.503	.625	.6287	1.254	.502	0.6308	28,554	20,580	.3125	Broke through crown of eye.	
1	45,267	Steel	.8875	1.9375		.503	.625	.6287	1.254	.503	0.6308	28,554	20,330	.2500	Do.	
1	45,267	Steel	.8875	1.9375		.503	.625	.6287	1.254	.503	0.6308	28,554	19,810	.1675	Do.	

2 1	48, 478	Steel...	.6875	{	Cut out from bar.	{	1.968	.503	.06	.5838	.3220	.962	.503	0.4900	24, 100	21, 470	.....	.4800	Broken through crown of eye; cracks on side of hole.
2 1 1	48, 478	Steel...	.6875	{	Cut out from bar.	{	1.968	.503	.06	.5838	.3220	.962	.503	0.4900	24, 100	20, 615	.....	.3700	Do.
2 1 1 1	48, 478	Steel...	.6875	{	Cut out from bar.	{	1.968	.503	.06	.5838	.3220	.962	.503	0.4900	24, 100	21, 845	21, 3105000	Do.
3 1	48, 478	Steel...	.6875	{	Cut out from bar.	{	1.94	.504	.065	.6263	.3475	1.25	.504	0.6300	30, 541	23, 500	.....	1.3825	Broken through crown of eye; cracked on sides of hole.
3 1 1	48, 478	Steel...	.6875	{	Cut out from bar.	{	1.94	.504	.065	.6313	.3503	1.25	.504	0.6300	30, 541	23, 740	.....	1.3825	Do.
3 1 1 1	48, 478	Steel...	.6875	{	Cut out from bar.	{	1.94	.504	.065	.6313	.3503	1.25	.504	0.6300	30, 541	22, 800	23, 347	1.3425	Do.
4 1	48, 327	Steel...	.6875	{	Cut out from bar.	{	1.989	.501	.753	.6270	.3773	1.25	.502	0.628	30, 349	25, 790	.....	.4500	Do.
4 1 1	48, 327	Steel...	.6875	{	Cut out from bar.	{	1.989	.501	.753	.6270	.3773	1.25	.502	0.628	30, 349	24, 960	.....	.5500	Do.
4 1 1 1	48, 327	Steel...	.6875	{	Cut out from bar.	{	1.989	.501	.753	.6270	.3773	1.25	.502	0.628	30, 349	24, 370	25, 0476000	Do.
5 1	48, 327	Steel...	.6875	{	Cut out from bar.	{	1.943	.503	.817	.6315	.4110	1.254	.503	0.6308	30, 485	27, 815	.....	.7187	Broken through side of eye; cracks all around hole.
5 1 1	48, 327	Steel...	.6875	{	Cut out from bar.	{	1.943	.503	.817	.6315	.4110	1.254	.503	0.6308	30, 485	26, 490	.....	.7500	Broken through crown of eye; cracks on side of hole.
5 1 1 1	48, 327	Steel...	.6875	{	Cut out from bar.	{	1.943	.503	.817	.6315	.4110	1.254	.503	0.6308	30, 485	28, 500	27, 4528125	Broken through side of eye; cracks on all sides of hole.
6 1	48, 478	Steel...	.6875	{	Cut out from bar.	{	1.944	.500	.883	.6283	.4415	1.253	.500	0.6285	30, 371	26, 735	.....	.5575	Broken through both sides of eye.
6 1 1	48, 478	Steel...	.6875	{	Cut out from bar.	{	1.944	.500	.883	.6283	.4415	1.253	.500	0.6285	30, 371	25, 715	.....	.4675	Do.
6 1 1 1	48, 478	Steel...	.6875	{	Cut out from bar.	{	1.944	.500	.883	.6283	.4415	1.253	.500	0.6285	30, 371	25, 760	26, 0704675	Do.
4 a	48, 327	Steel...	.6875	{	Cut out from bar.	{	1.942	.502	.82	.6298	.4116	1.075	.502	0.5397	26, 082	26, 055	.....	1.1250	Broken through shank; cracks on both sides of hole for pin.
4 a	48, 327	Steel...	.6875	{	Cut out from bar.	{	1.942	.502	.82	.6298	.4116	1.075	.502	0.5397	26, 082	26, 000	26, 028	1.2187	Do.

TABLE B.—Test made to determine the proper dimensions of pins, eyes, and shanks of boiler braces to insure equal strength throughout.

Those specimens made without forging, were cut from 2½" by ½" flat bar iron, planed smooth on both sides, brought to the proper thickness and the holes reamed to fit the pins accurately; they were then put on mangle and cut out to the required shape in the shaping machine. In making those specimens with welded eyes, the pieces were first drawn out and bent and welded over a mandrel which was one-eighth inch less in diameter than the finished hole.

Mark on specimen.	Tensile strength of bar from which made.	Pins.		Eyes of braces.				Shank of braces.				Specimen.			Remarks.		
		Steel or iron.	Diameter.	How made.	Outside diameter.	Thickness.	Depth from crown to hole.	Sectional area at sides of hole.	Sectional area at crown.	Breadth.	Thickness.	Area.	Calculated strength.	Broke at—		Mean of three breaks.	Distance between centers of holes.
	Per sq. inch.		In.		In.	In.	In.	In.	In.	In.	In.	Sq. in.	Lbs.	Lbs.	Lbs.	In.	
1 X 1111	45,267	Steel	.8125	Cut out from bar.	1.94	.504	.5625	.5683	.2835	1.125	.504	0.567	25,666	19,320	.....	4000	Broke through crown of eye; cracked on sides of hole.
1 X 1111	45,267	Steel	.8125		1.94	.504	.5625	.5683	.2835	1.125	.504	0.567	25,666	18,400	.....	3500	Broke through crown of eye and lower quarter of hole.
1 X 1111	45,267	Steel	.8125		1.94	.504	.5625	.5683	.2835	1.125	.504	0.567	25,666	20,800	.....	5000	Broke through crown of eye; slight cracks on sides of hole.
2 X 1111	48,478	Steel	.8125	Cut out from bar.	2.191	.502	.693	.6920	.3479	1.25	.502	0.6275	30,420	22,875	.....	4125	Broke through crown of eye; slight cracks on sides of hole.
2 X 1111	48,478	Steel	.8125		2.191	.502	.693	.6920	.3479	1.25	.502	0.6275	30,420	22,810	.....	3625	Do.
2 X 1111	48,478	Steel	.8125		2.191	.502	.693	.6920	.3479	1.25	.502	0.6275	30,420	24,600	.....	4625	Do.
3 X 1111	48,327	Steel	.8125	Cut out from bar.	2.191	.501	.753	.6906	.3773	1.257	.501	0.6298	30,434	25,740	.....	6875	No break about eye or shank; but split out at bottom of lower hole at 25,740 pounds.
3 X 1111	48,327	Steel	.8125		2.191	.501	.753	.6906	.3773	1.257	.501	0.6298	30,434	22,940	.....	4000	Broke through crown of eye; slight cracks on sides of hole.
3 X 1111	48,327	Steel	.8125		2.191	.501	.753	.6906	.3773	1.257	.501	0.6298	30,434	25,815	.....	6875	Broke through side of eye; cracks on all sides of hole.
4 X 1111	48,327	Steel	.8125	Cut out from bar.	2.188	.502	.814	.6905	.4086	1.254	.502	0.6295	30,422	25,610	.....	5625	Broke through crown of eye; cracks on sides of hole.
4 X 1111	48,327	Steel	.8125		2.188	.502	.814	.6905	.4086	1.254	.502	0.6295	30,422	27,170	.....	8125	Broke through both sides of eye.
4 X 1111	48,327	Steel	.8125		2.188	.502	.814	.6905	.4086	1.254	.502	0.6295	30,422	26,800	.....	7500	Broke through one side of eye; cracks all around hole.
1 X 1111	48,878	Iron	1.000	Cut out from bar.	2.251	.500	.626	.6250	.3130	.995	.500	0.4980	24,341	22,720	.....	5875	Broke through lower quarter of hole.
1 X 1111	48,878	Iron	1.000		2.251	.500	.626	.6250	.3130	.995	.500	0.4980	24,341	22,935	.....	6375	Broke through crown; cracked on side of hole.
1 X 1111	48,878	Iron	1.000		2.251	.500	.626	.6250	.3130	.995	.500	0.4980	24,341	23,122	.....	7375	Broke through crown and cracked through lower quarter of hole.

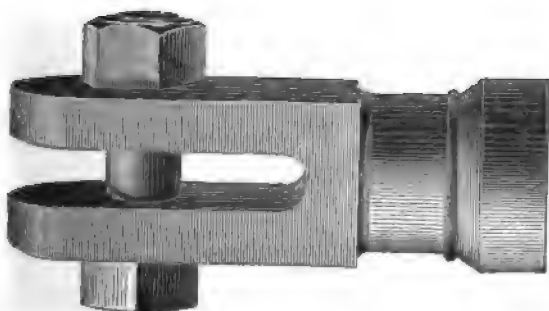
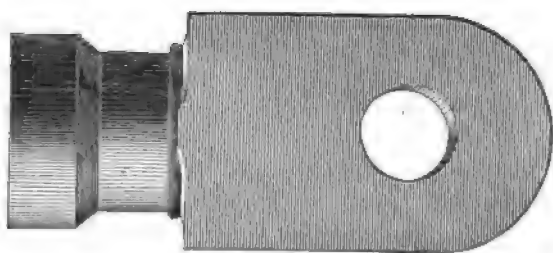
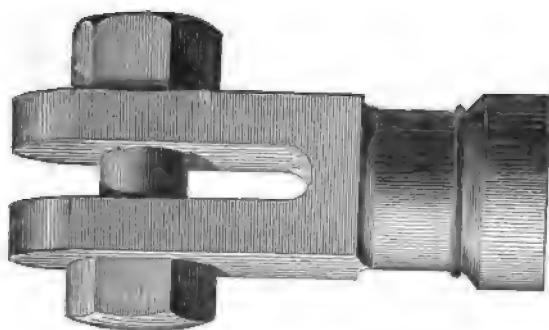
2 Y 11	48,878	Iron	1,180	Cut out from bar.	2,361	.502	.625	.6280	.3138	1.005	.502	0.5045	24,430	21,000	.0025	Broke through crown of eye; shank showed cracks of strain; cracked on sides of hole.
2 Y 11	48,878	Iron	1,180		2,361	.502	.625	.6280	.3138	1.005	.502	0.5045	24,430	21,000	.0025	Do.
2 Y 11	48,878	Iron	1,180		2,361	.502	.625	.6280	.3138	1.005	.502	0.5045	24,430	21,000	.0025	Do.
3 Y 1	48,878	Iron	1,182	Cut out from bar.	2,435	.500	.632	.6265	.3160	1.002	.500	0.5010	24,488	23,550	.8350	Broke through crown of eye; lower quarter of eye cracked.
3 Y 1	48,878	Iron	1,182		2,435	.500	.632	.6265	.3160	1.002	.500	0.5010	24,488	23,550	.8350	Do.
3 Y 1	48,878	Iron	1,182		2,435	.500	.632	.6265	.3160	1.002	.500	0.5010	24,488	23,550	.8350	Do.
4 Y 1	48,878	Iron	1,200	Cut out from bar.	2,516	.502	.628	.6305	.3153	1.004	.502	0.5040	24,635	21,470	.4082	Broke through one side of lower part of hole, and started on opposite side.
4 Y 1	48,878	Iron	1,200		2,516	.502	.628	.6305	.3153	1.004	.502	0.5040	24,635	21,470	.4082	Broke through both sides of lower part of hole.
4 Y 1	48,878	Iron	1,200		2,516	.502	.628	.6305	.3153	1.004	.502	0.5040	24,635	21,470	.4082	Do.
4 L 1	48,878	Iron	1,000	Cut out from bar.	2,25	.502	.753	.6275	.3780	.995	.502	0.4965	24,414	24,495	.7812	Broke through shank, and cracks started on sides of hole.
4 L 1	48,878	Iron	1,000		2,25	.502	.753	.6275	.3780	.995	.502	0.4965	24,414	23,965	.6562	Do.
4 L 1	48,878	Iron	1,000		2,25	.502	.753	.6275	.3780	.995	.502	0.4965	24,414	24,380	.6875	Do.

TABLE C.—*Test made to determine the proper dimensions of pins, eyes, and shanks of boiler braces, to insure equal strength throughout.*

All of these specimens were made from bars slightly larger than required; the eye was formed by upsetting the bar, and the hole was drilled. The bar and eye were brought as nearly as possible to given dimensions in the lathe and planer.

Mark on specimen.	Tensile strength of bar from which made.	Pin.	Eye of brace.								Shank of brace.			Specimen.		Remarks.
			Steel or iron.	Diameter.	Diameter of hole.	Breadth of one side.	Outside diameter.	Thickness.	Depth from crown to hole.	Sectional area across eye.	Sectional area at crown.	Diameter.	Area.	Calculated strength.	Broke at—		Mean of three breaks.	Elongation between centers of holes.
	<i>Per sq. in.</i>		<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>Sq. in.</i>	<i>In.</i>	<i>Sq. in.</i>	<i>Lbs.</i>	<i>Lbs.</i>	<i>Lbs.</i>	<i>In.</i>	<i>In.</i>
A 31.....	56,530	Iron ..	1.120	1.125	.651	2.434	1.123	.651	1.46214	.731073	1.123	.90049	.....	56,530	.....	1.04
A 311.....	56,530	do ..	1.120	1.125	.651	2.434	1.123	.651	1.46214	.731073	1.123	.90049	.....	56,000	.....	.043
A 3111.....	56,530	do ..	1.120	1.125	.651	2.434	1.123	.651	1.46214	.731073	1.123	.90049	55,992	54,770	55,996	.047
A 21.....	56,530	Iron ..	1.120	1.125	.681	2.498	1.120	.805	1.52344	.9016	1.123	.90049	.....	55,000	.....	.012
A 211.....	56,530	do ..	1.120	1.125	.681	2.498	1.120	.805	1.52344	.9016	1.123	.90049	55,992	54,500	55,210	.028
A 2111.....	56,530	do ..	1.120	1.125	.681	2.498	1.120	.805	1.52344	.9016	1.123	.90049	.....	55,130	.....	.020
A 11.....	56,530	Iron ..	1.120	1.125	.75	2.625	1.120	.872	1.68	.97664	1.123	.90049	.....	57,600	.....	.002
A 111.....	56,530	do ..	1.120	1.125	.75	2.625	1.120	.872	1.68	.97664	1.123	.90049	55,992	56,950	56,187	.008
A 1111.....	56,530	do ..	1.120	1.125	.75	2.625	1.120	.872	1.68	.97664	1.123	.90049	.....	56,000	.....	.004
B 31.....	54,023	Iron ..	1.435	1.441	.684	2.819	1.25	.684	1.710	.855	1.25	1.2727	.....	67,050	.....	.088
B 311.....	54,023	do ..	1.435	1.441	.684	2.819	1.25	.684	1.710	.855	1.25	1.2727	66,297	67,350	66,583	.083
B 3111.....	54,023	do ..	1.435	1.441	.684	2.819	1.25	.684	1.710	.855	1.25	1.2727	.....	67,350	.....	.086
B 21.....	54,023	Iron ..	1.435	1.441	.691	2.811	1.247	.815	1.72335	1.0163	1.245	1.21737	.....	66,390	.....	.087
B 211.....	54,023	do ..	1.435	1.441	.691	2.811	1.247	.815	1.72335	1.0163	1.245	1.21737	65,766	66,300	65,796	.099
B 2111.....	54,023	do ..	1.435	1.441	.691	2.811	1.247	.815	1.72335	1.0163	1.245	1.21737	.....	66,300	.....	.075
B 11.....	54,023	Iron ..	1.435	1.441	.752	2.944	1.25	.880	1.88	1.100	1.245	1.21737	.....	65,400	.....	.033
B 111.....	54,023	do ..	1.435	1.441	.752	2.944	1.25	.880	1.88	1.100	1.245	1.21737	65,766	66,600	.....	.030
B 1111.....	54,023	do ..	1.435	1.441	.752	2.944	1.25	.880	1.88	1.100	1.245	1.21737	65,766	65,500	65,866	.036
C 31.....	51,847	Iron ..	1.5	1.509	.880	3.264	1.5	1.004	2.64	1.506	1.5	1.7671	.....	91,600	.....	.041
C 311.....	51,847	do ..	1.5	1.509	.880	3.264	1.5	1.004	2.64	1.506	1.5	1.7671	91,618	93,000	.....	.051
C 3111.....	51,847	do ..	1.5	1.509	.880	3.264	1.5	1.004	2.64	1.506	1.5	1.7671	.....	93,000	92,066	.041

**JAWS FOR HOLDING THE SPECIMENS
IN THE TESTING MACHINE.**



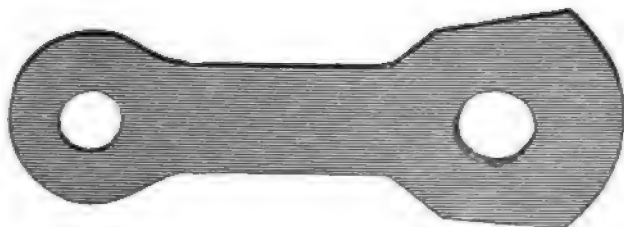
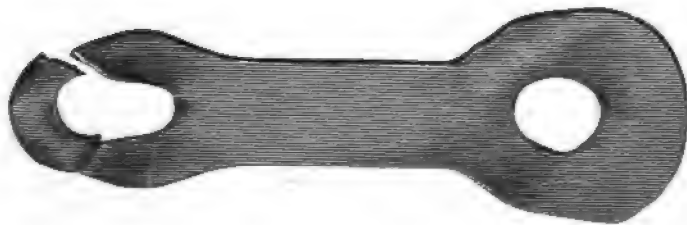
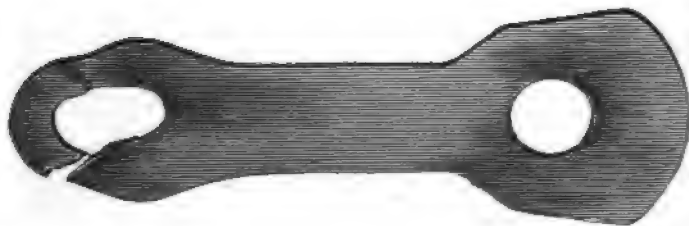
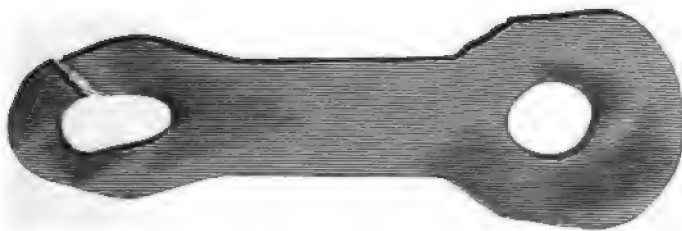
BAR BENT OVER AND WELDED TO FORM EYE.

BROKE AT 25,355 lbs.

BROKE AT 25,900 lbs.

BROKE AT 26,160 lbs.

Diameter of pin 0.0875 in.
 Extreme breadth across eye - 1.946 in.
 Depth from crown of eye to
 hole 0.565 in.
 Tensile strength of bar from
 which made, per sq. inch - 45,267 lbs.



BAR BENT OVER AND WELDED TO FORM EYE.

BROKE AT 28,750 lbs. BROKE AT 24,450 lbs. BROKE AT 19,320 lbs.

Diameter of pin 1.587 in.
 Extreme breadth across eye . . . 1.524 in.
 Depth from crown of eye to hole 0.625 in.
 Tensile strength of bar from which made, per sq. inch = 48,287 lbs.



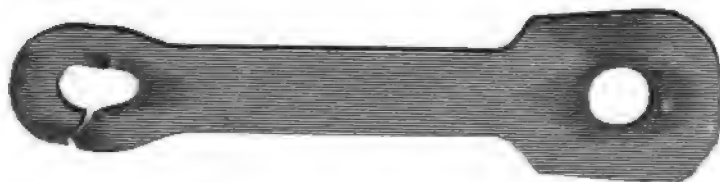
BAR BENT OVER AND WELDED TO FORM EYE

Diameter of pin 0.6875 in.
 Extreme breadth across eye - 1.91 in.
 Depth from crown of eye to
 hole 0.605 in.
 Tensile strength of bar from
 which made, per sq. inch - 48,478 lbs.

BROKE AT 29,925 lbs.

BROKE AT 28,765 lbs

BROKE AT 28,475 lbs.



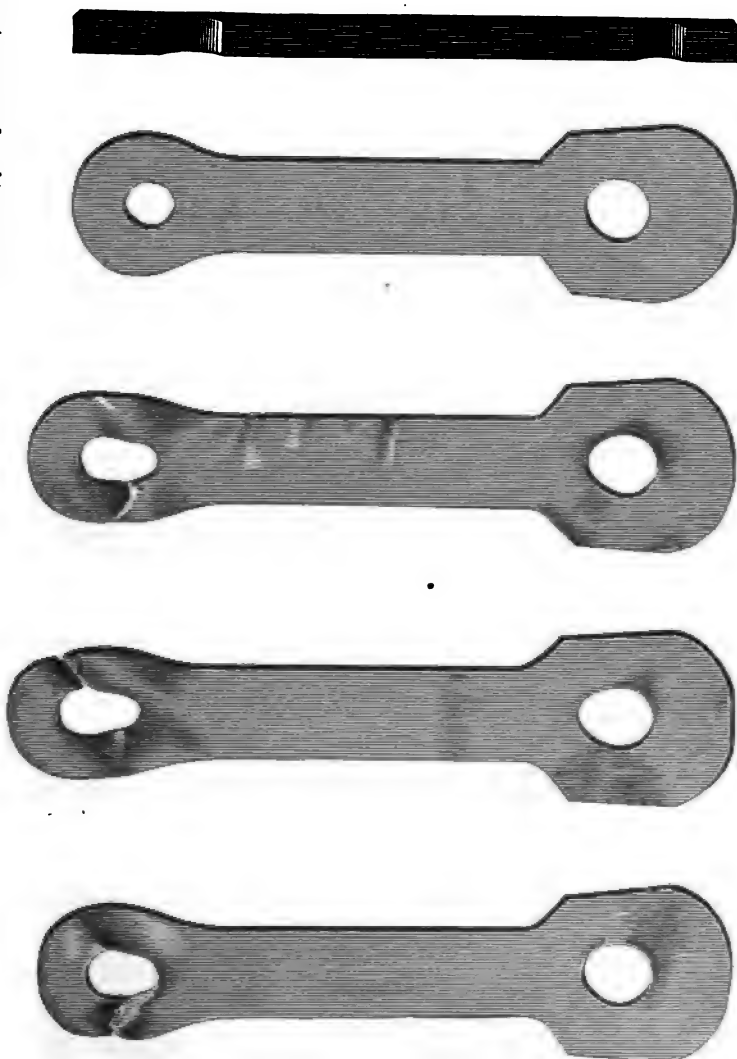
BAR BENT OVER AND WELDED TO FORM EYE.

BROKE AT 25,775 lbs.

BROKE AT 30,535 lbs.

BROKE AT 28,310 lbs.

Diameter of pin 0.875 in.
 Extreme breadth across eye . 1.94 in.
 Depth from crown of eye to
 hole 0.753 in.
 Tensile strength of bar from
 which made, per sq. inch . 48,827 lbs.



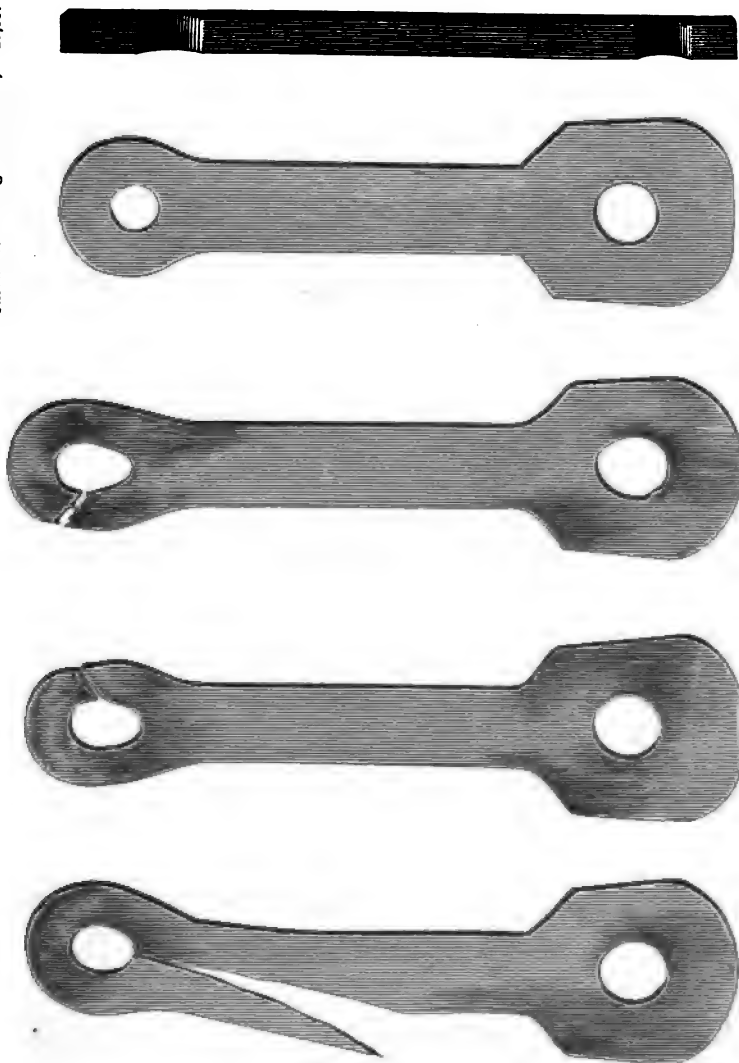
BAR BENT OVER AND WELDED TO FORM EYE

BROKE AT 27,200 lbs.

BROKE AT 27,155 lbs.

BROKE AT 29,585 lbs.

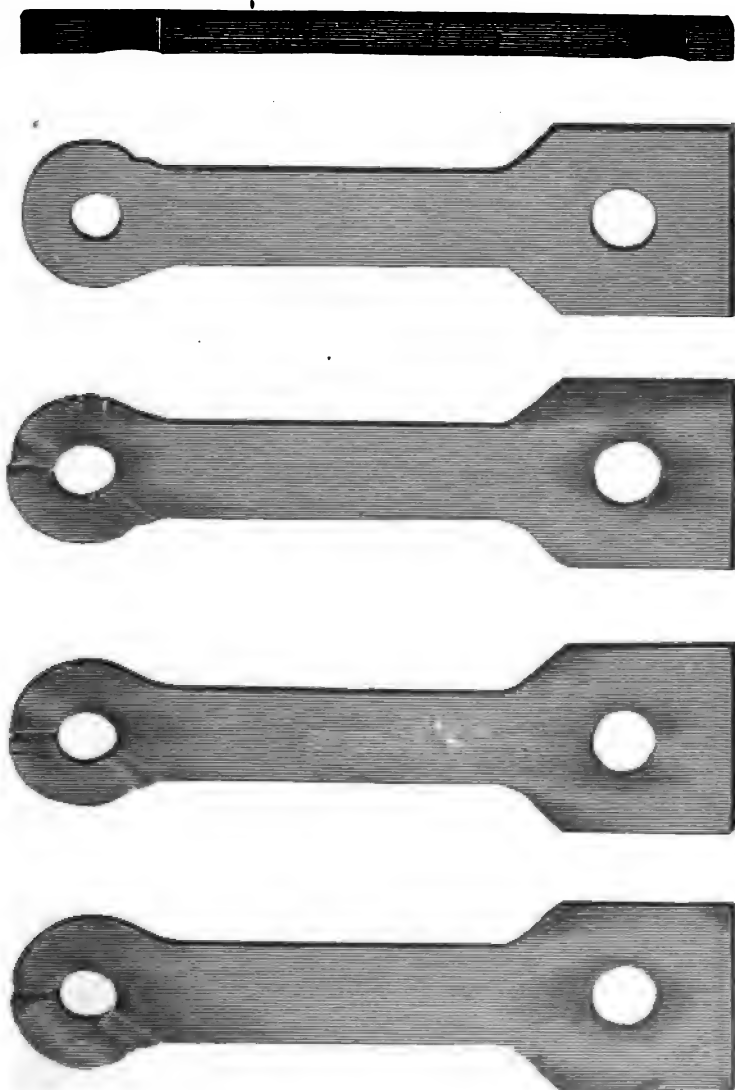
Diameter of pin 0.6875 in.
 Extreme breadth across eye - 1.868 in.
 Depth from crown of eye to
 hole 0.661 in.
 Area of shank=1.186 by .506=.5996 sq. in.
 Tensile strength of bar from
 which made, per sq. inch - 48,478 lbs.
 Calculated strength of shank, 29,067 lbs.



EYE OUT FROM THE FLAT HALL.

BROKE AT 19,810 lbs. BROKE AT 20,330 lbs. BROKE AT 20,560 lbs.

Diameter of pin 0.625 in.
 Extreme breadth across eye 1.657 in.
 Depth from crown of eye to hole 0.625 in.
 Tensile strength of bar from which made, per sq. inch - 45,287 lbs.



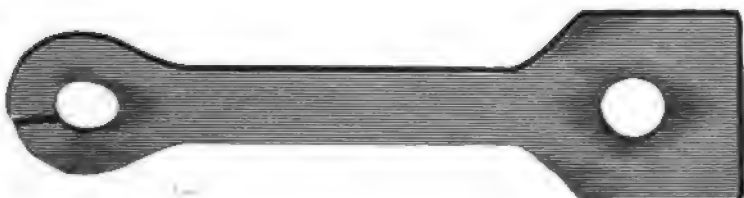
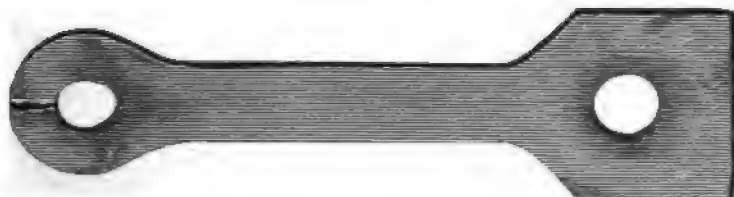
EYE CUT FROM THE FLAT BAR.

Diameter of pin 0.0075 in.
 Extreme breadth across eye . . 1.848 in.
 Depth from crown of eye to
 hole 0.06 in.
 Tensile strength of bar from
 which made, per sq inch . . 48,478 lbs

BROKE AT 21,470 lbs.

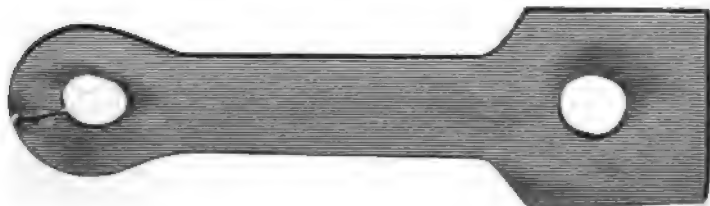
BROKE AT 20,613 lbs.

BROKE AT 21,845 lbs.



EYE CUT FROM THE FLAT BAR.**BROKE AT 22,800 lbs.****BROKE AT 23,740 lbs****BROKE AT 23,600 lbs.**

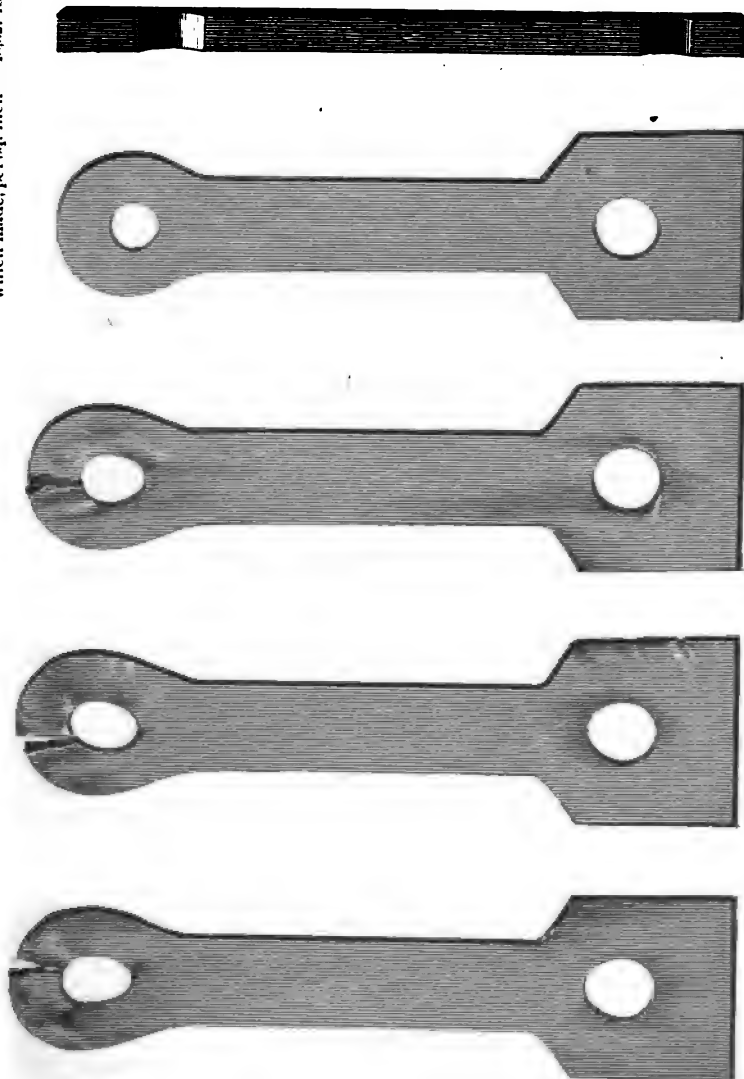
Diameter of pin 0.6875 in.
 Extreme breadth across eye . . 1.94 in.
 Depth from crown of eye to
 hole 0.005 in.
 Tensile strength of bar from
 which made, per sq. inch . . 48,478 lbs.



EYE OUT FROM THE FLAT BAR.

Diameter of pin 0.675 in.
 Extreme breadth across eye - 1.929 in.
 Depth from crown of eye to
 hole 0.753 in.
 Tensile strength of bar from
 which made, per sq. inch - 48,327 lbs.

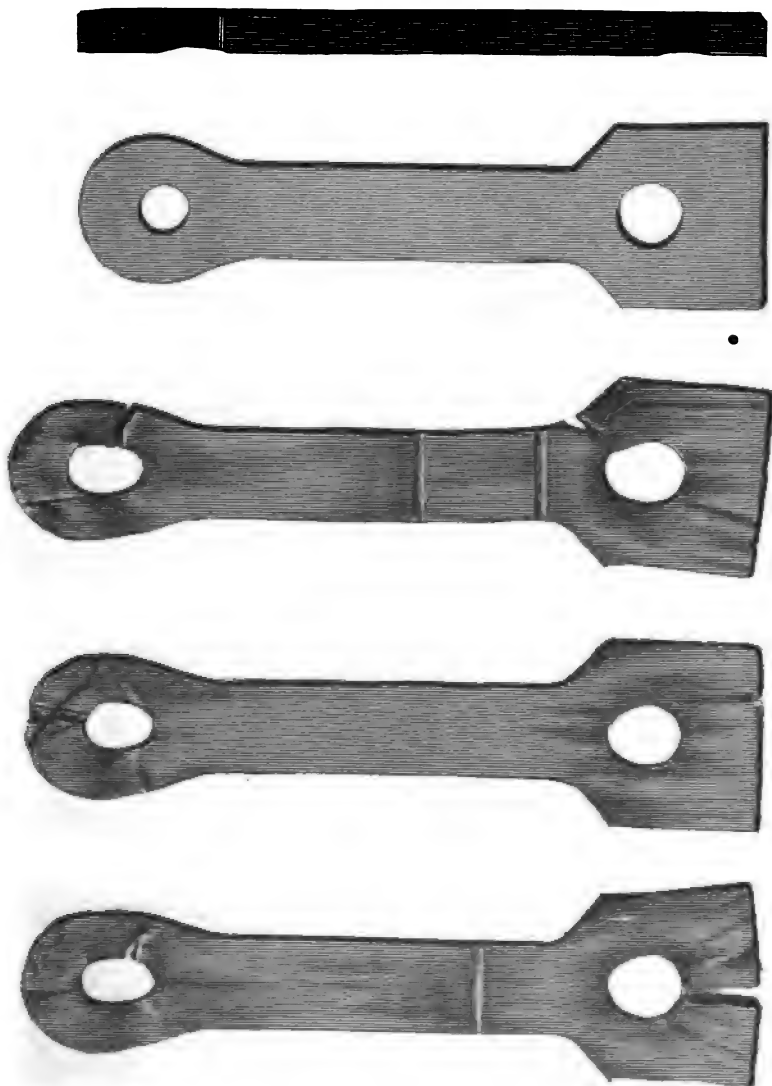
BROKE AT 21,370 lbs. BROKE AT 24,980 lbs. BROKE AT 25,700 lbs.



Extreme breadth across eye - 1.043 in.
 Depth from crown of eye to
 hole - - - - - 0.817 in.
 Tensile strength of bar from
 which made, per sq. inch - - 48,327 lbs.

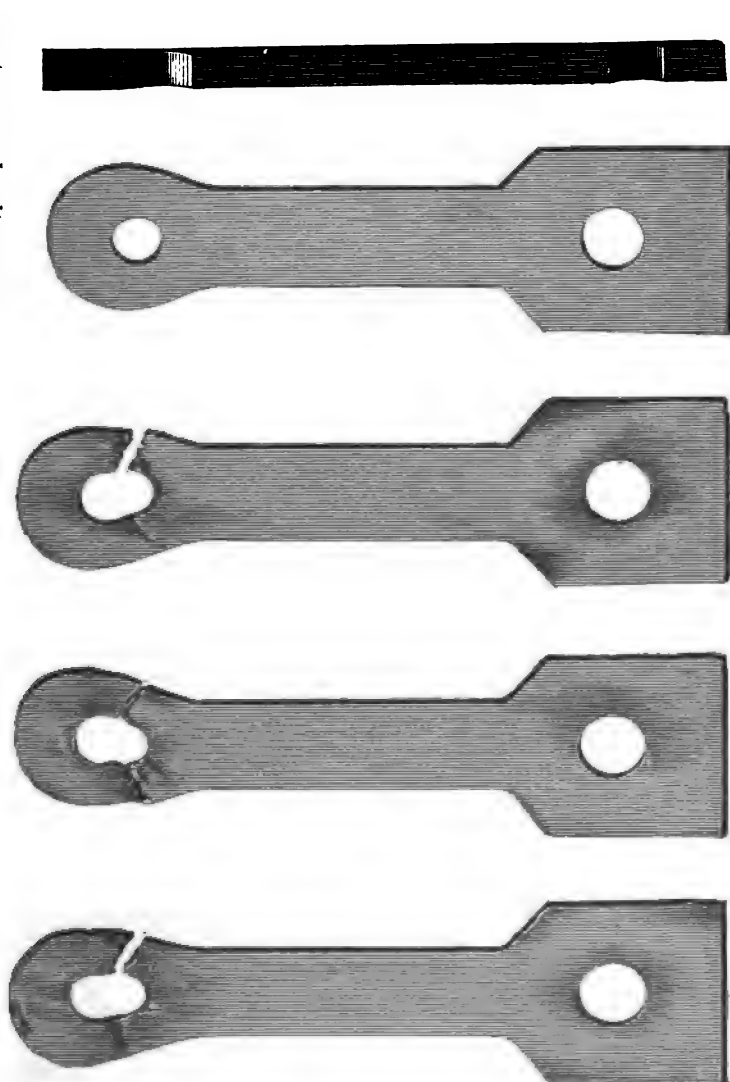
EYE CUT FROM THE FLAT BAR.

BROKE AT 27,315 lbs. BROKE AT 26,480 lbs. BROKE AT 28,560 lbs.



EYE CUT FROM THE FLAT BAR.

BROKE AT 20,755 lbs. BROKE AT 25,715 lbs. BROKE AT 25,760 lbs



Diameter of pin 0.6575 in.
 Extreme breadth across eye . 1.911 in.
 Depth from crown of eye to
 hole 0.883 in.
 Tensile strength of bar from
 which made, per sq. inch . 48,478 lbs.

EYE CUT FROM THE FLAT BAR.

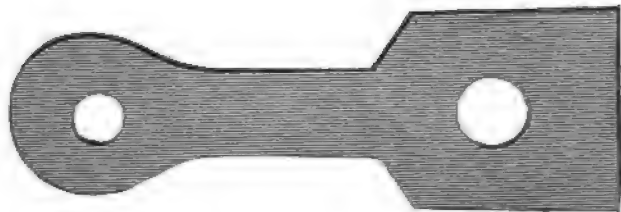
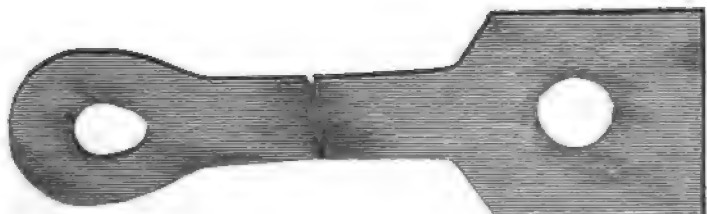
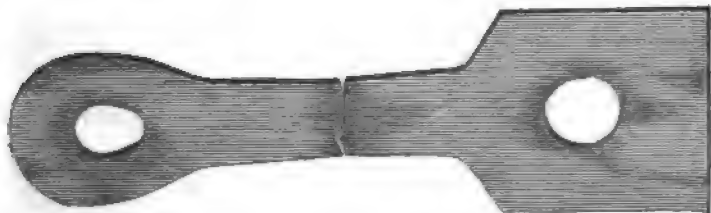
BROKE AT 26,055 lbs.

BROKE AT 26,000 lbs.

Diameter of pin 0.0875 in.
 Extreme breadth across eye . . . 1.042 in.
 Depth from crown of eye to
 hole 0.82 in.

Area of shank = 1.075 by .502 = 0.5397 sq. in.

Tensile strength of bar from
 which made, per sq. inch . . . 48,327 lbs.
 Calculated strength of shank 26,082 lbs.



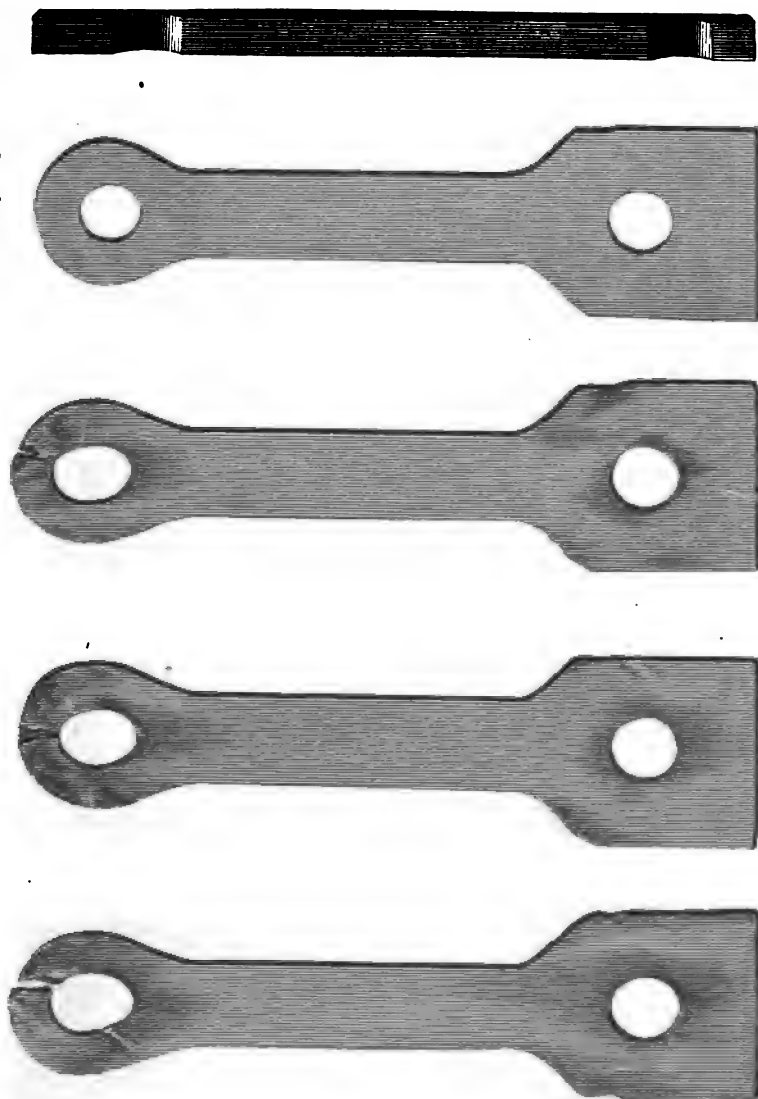
EYE CUT FROM THE FLAT BAR.

BROKE AT 20,800 lbs.

BROKE AT 18,600 lbs.

BROKE AT 19,220 lbs.

Diameter of pin 0.4125 in.
 Extreme breadth across eye - 1.04 in.
 Depth from crown of eye to
 hole 0.5625 in.
 Tensile strength of bar from
 which made, per sq. inch - 45,367 lbs.



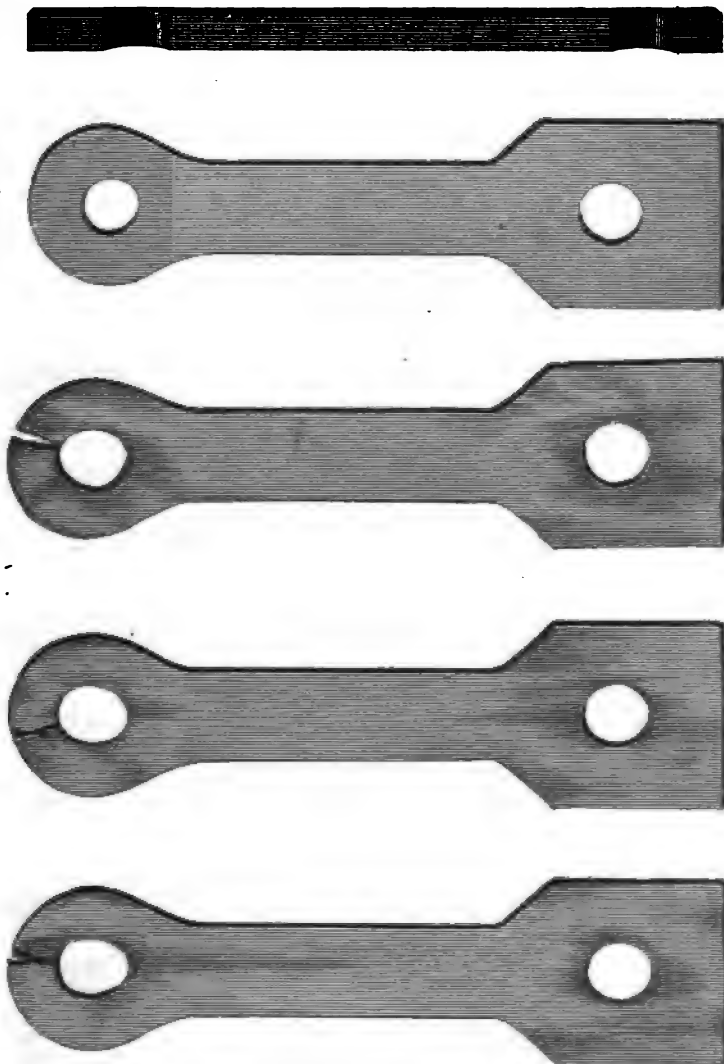
EYE CUT FROM THE FLAT BAR.

Diameter of pin 0.8125 in.
 Extreme breadth across eye . 2.191 in.
 Depth from crown of eye to
 hole 0.693 in.
 Tensile strength of bar from
 which made, per sq. inch . 48,478 lbs.

BROKE AT 24,660 lbs.

BROKE AT 23,810 lbs

BROKE AT 23,875 lbs.



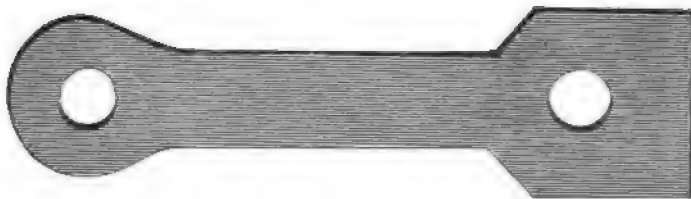
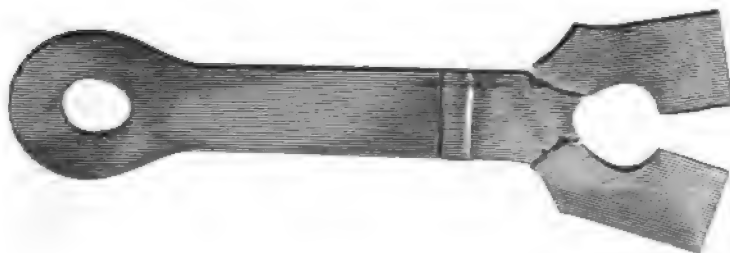
EYE CUT FROM THE FLAT BAR.

BROKE AT 23,740 lbs.

BROKE AT 22,940 lbs

BROKE AT 25,815 lbs.

Diameter of pin 0.8125 in.
 Extreme breadth across eye - 2.191 in.
 Depth from crown of eye to
 hole 0.773 in.
 Tensile strength of bar from
 which made, per sq. inch - 48,327 lbs.



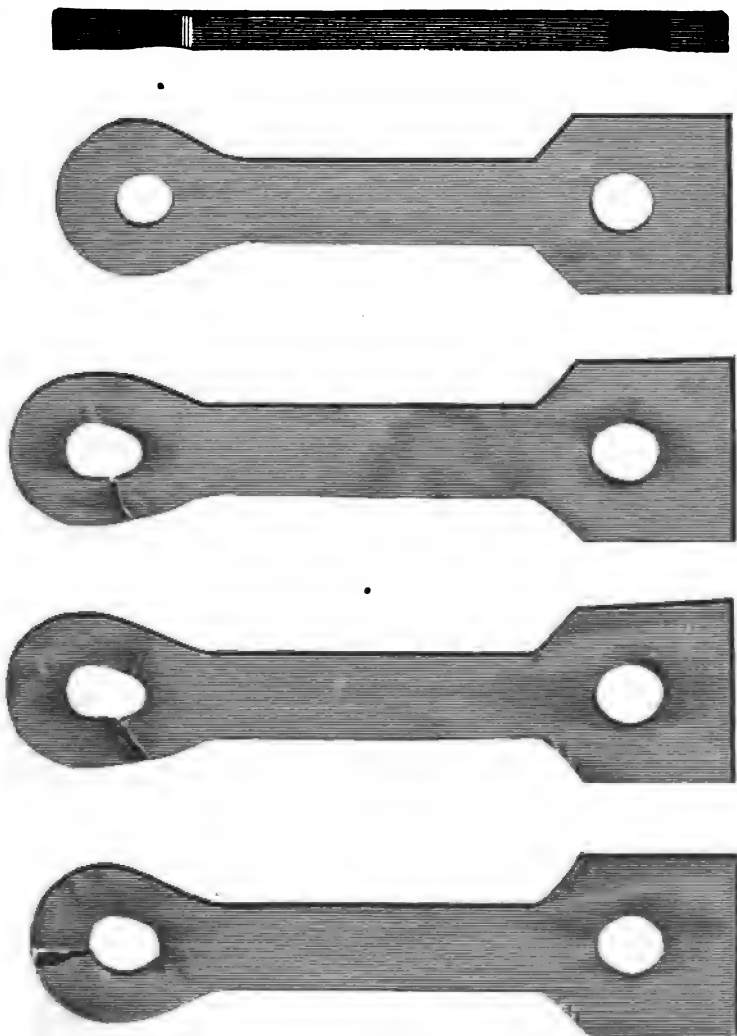
EYE CUT FROM THE FLAT BAR.

BROKE AT 25,610 lbs.

BROKE AT 27,170 lbs.

BROKE AT 28,800 lbs.

Diameter of pin 0.8125 in.
 Extreme breadth across eye . 2.188 in.
 Depth from crown of eye to
 hole 0.811 in.
 Tensile strength of bar from
 which made, per sq. inch . 43,327 lbs.



EXTENSIVE DEPTH SCREW EYE - 2.500 IN.

Depth from crown of eye to hole - - - - - 0.026 in.

Area of shank .996 by .5 = 0.498 sq. in.

Tensile strength of bar from

which made, per sq. inch - 48,878 lbs.

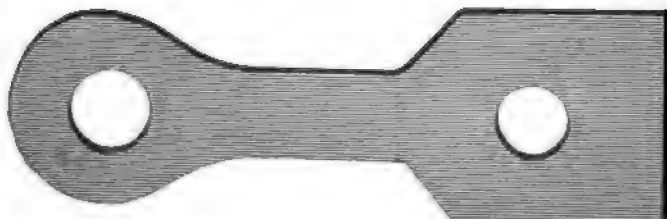
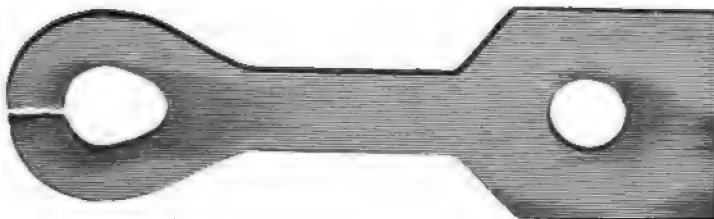
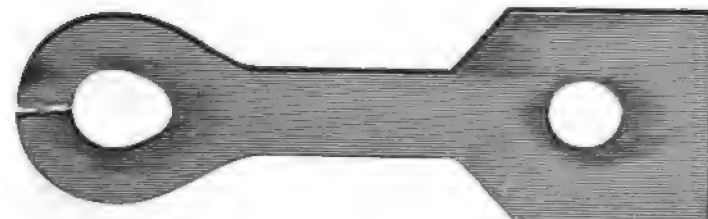
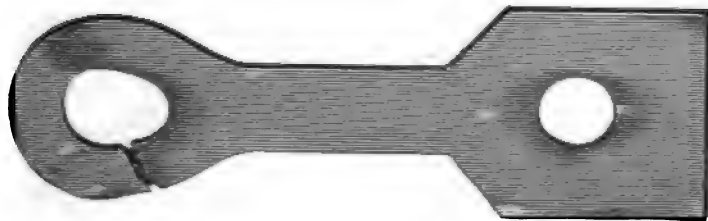
Calculated strength of shank 24,341 lbs.

EYE CUT FROM THE FLAT BAR.

BROKE AT 22,730 lbs.

BROKE AT 22,935 lbs.

BROKE AT 23,710 lbs.

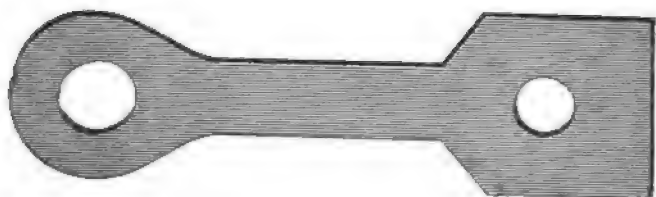
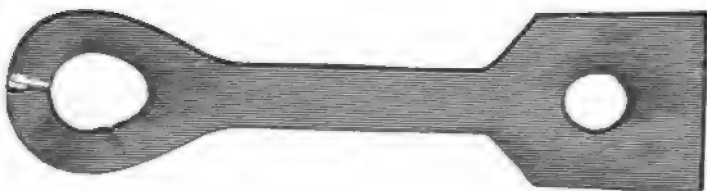
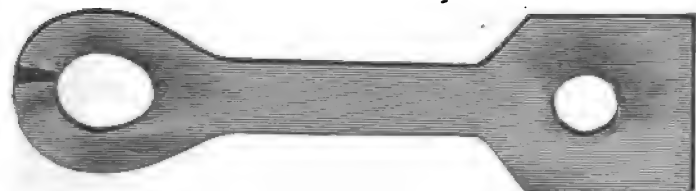


EYE CUT FROM THE FLAT BAR.

BROKE AT 23,105 lbs.

BROKE AT 22,925 lbs.

BROKE AT 24,000 lbs.



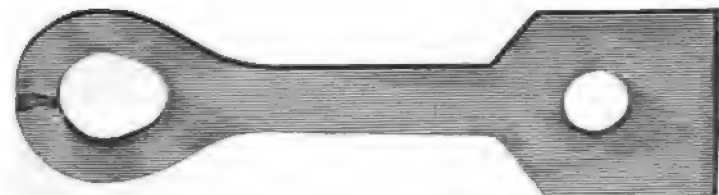
Extreme breadth across eye 1.54 in.
 Depth from crown of eye to
 hole 0.625 in.
 Area of shank 1.645 by .562 = 0.9345 sq. in.
 Tensile strength of bar from
 which made, per sq. inch = 48,878 lbs.
 Calculated strength of shank, 24,659 lbs.

EYE CUT FROM THE FLAT BAR.

BROKE AT 23,550 lbs.

BROKE AT 22,780 lbs.

BROKE AT 23,250 lbs.



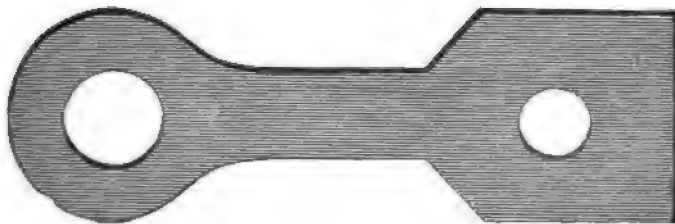
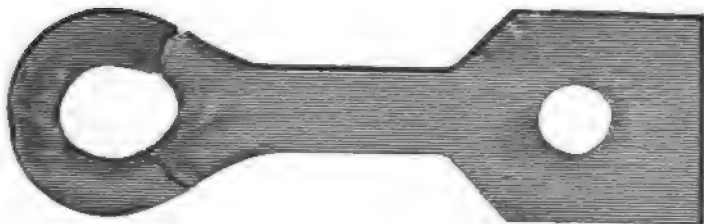
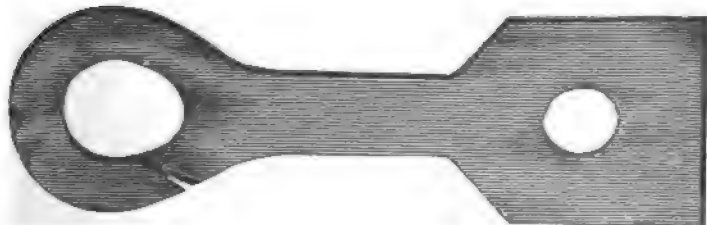
Diameter of pin - 1.382 in.
 Extreme breadth across eye - 2.65 in.
 Depth from crown of eye to
 hole - .062 in.
 Area of shank - 1.002 by .5 - 0.501 sq. in.
 Tensile strength of bar from
 which made, per sq. inch - 48,878 lbs.
 Calculated strength of shank - 24,498 lbs.

EYE OUT FROM THE FLAT BAR.

BROKE AT 21,470 lbs.

BROKE AT 21,700 lbs.

BROKE AT 22,240 lbs.



Extreme breadth across eye - 4.616 in.
Depth from crown of eye to hole - 0.628 in.

Area of shank = 1.004 by .502 = 0.5040 sq. in.

Tensile strength of bar from

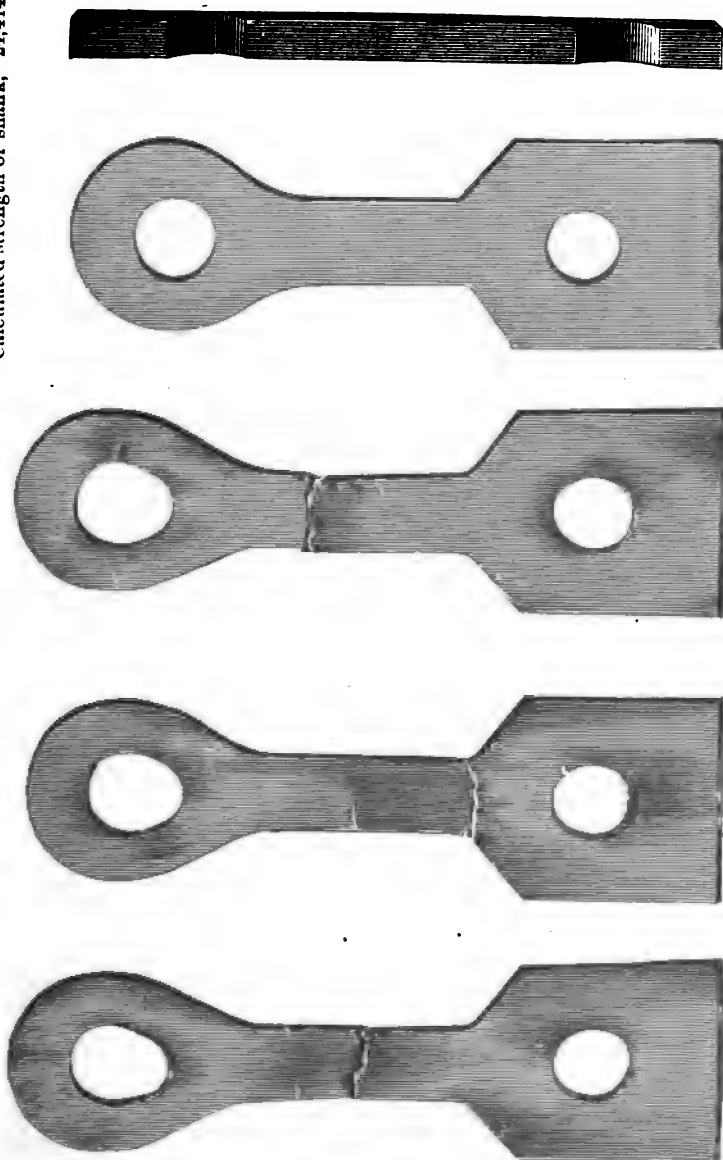
which made, per sq. inch - 48,878 lbs.

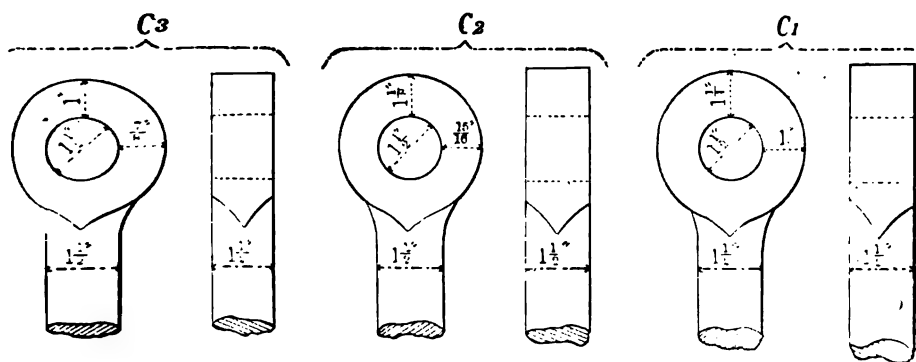
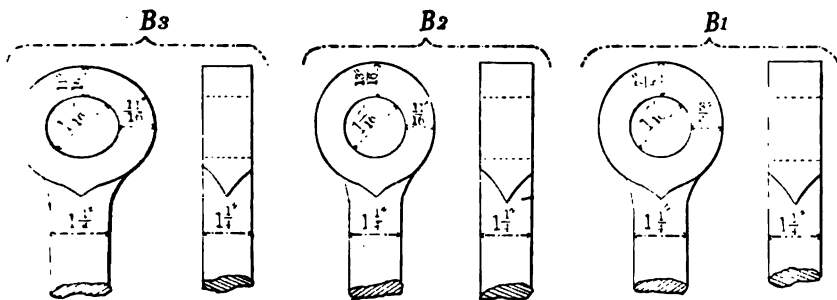
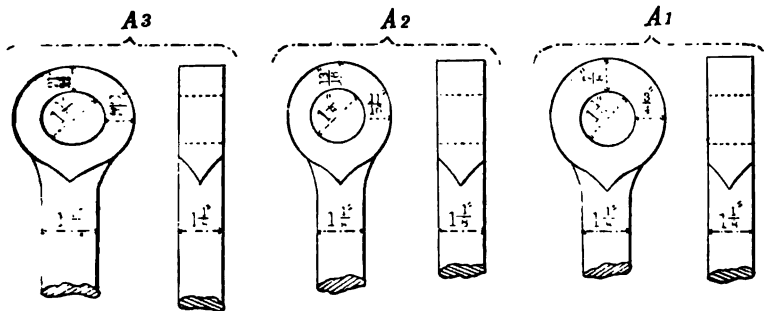
Calculated strength of shank 24,635 lbs.

EYE OUT FROM THE FLAT BAR.

Diameter of pin - - - - - 1 in.
 Extreme breadth across eye - 2.25 in.
 Depth from crown of eye to
 hole - - - - - 0.753 in.
 Area of shank = .998 by .502 = 0.4995 sq. in.
 Tensile strength of bar from
 which made, per sq. inch - - 48,878 lbs.
 Calculated strength of shank, 24,414 lbs.

BROKE AT 24,495 lbs. BROKE AT 23,965 lbs. BROKE AT 24,390 lbs.





C. 211 C. 211 C. 211	51,847 51,847 51,847	Iron do do	1.5 1.5 1.5	1,500 1,500 1,500	8076 8075 8076	3.375 3.375 3.375	1.5 1.5 1.5	1.125 1.125 1.125	2,8125 2,8125 2,8125	1.875 1.875 1.875	1.5 1.5 1.5	1.7671 1.7671 1.7671	91,018 91,018 91,018	92,800 92,800 92,800	90,000 90,000 90,000	113 113 113	.001 .001 .001	Broke in shank Do. Do.
G. 11	51,847	Iron	1.5	1,500	8076	3.375	1.5	1.125	2,8125	1.875	1.5	1.7671	91,018	92,800	90,000	113	.001	Broke in shank.
G. 11	51,847	do	1.5	1,500	8075	3.375	1.5	1.125	2,8125	1.875	1.5	1.7671	91,018	92,800	90,000	113	.011	Do.
G. 11	51,847	do	1.5	1,500	8076	3.375	1.5	1.125	2,8125	1.875	1.5	1.7671	91,018	92,800	90,000	113	.001	Do.

No. 9.—BUREAU OF MEDICINE AND SURGERY.

NAVY DEPARTMENT,
BUREAU OF MEDICINE AND SURGERY,
October 31, 1879.

SIR: In response to your order of the 3d instant, I have the honor to submit the usual annual report of the Bureau of Medicine and Surgery, which comprises a statistical exhibit of the diseases and casualties occurring in the Navy during the year 1878, and estimates for the support of the medical department for the fiscal year ending June 30, 1881.

It will be seen that the health of the officers and men displays no material alteration since the last report, but it is hoped that the active efforts of the department, now being exerted, supplemented by the sincere co-operation of officers of all grades in improving the sanitation of ships of war, will, in the near future, result in such success as to greatly diminish the sick-rate.

It was an opprobrium of sanitary science for years that no efficient and practical plans had been devised to prevent, or even to ameliorate the terrific suffering of early mariners, and even when science finally furnished correct data for this purpose, the supineness of officials or adherence to ancient customs furnished a barrier to their realization. It thus befell that, under these circumstances, national enterprises, both commercial and military, often failed of accomplishment, or were imperfectly consummated by reason of loss of life and health of officers and men of ships and fleets from remediable causes. History narrates confirmatory facts in the memorable contests of the continental powers for maritime supremacy and foreign conquest, during the seventeenth and eighteenth centuries; and later, the experiences of our own Navy and commercial marine contribute their quota of death and suffering to swell the army of martyrs to ignorance of sanitary laws and bad naval construction. The grievances of the early navigators were bad water, wretched food, and pernicious air, arising either from over-crowding, defective ventilation, or imperfect construction, whereby chips and other débris of the building materials were sealed up in the spaces between the timbers to undergo putrefactive changes, without any possibility of the accumulated mass being washed out through properly constructed conduits. The deposits mingled with the leakages of molasses, vinegar, and various other materials of organic origin, formed an admirable hot-bed, so to speak, evolving abundant morbid exhalations and fostering mortiferous contagia. The influence of all these various causes of disease and death among seamen was, for a long time, not fully appreciated.

It was imagined that good food and water were the chief essentials of health on long voyages: that as long as the stomach was catered to efficiently it mattered little about the quality of the material with which the lungs were fed. This erroneous notion of the importance of abundant wholesome air has cost nations thousands of lives and millions of money. Sanitary science has not labored in vain in later times in teaching the paramount fact that pure air is triune with pure food and pure water in sustaining healthy and vigorous life. The broader mental culture and deeper interests in such studies, now prevalent among officers, have combined greatly to disseminate more correct views in these particulars. Indeed, thought is pressed to run in these channels now that human life has come to be regarded as more valuable to the nation, which very naturally expects those to whom it entrusts the control of

large bodies of its citizens, to familiarize themselves with the health laws upon which their usefulness and efficiency depend. The progress of science has brought amelioration of the hardships of human life the world over; the mariner no longer floats on the ocean the toy of the elements; steam enables him to control the situation perfectly; by its means he flies over his course when favorable winds and tides fail to render their assistance, and at the same time it furnishes a perennial spring of pure fresh water. The coarse monotonous food, saturated with salt and hardened by months of stowage, has given way to wholesome viands, fruits, and vegetables, which have not only banished scurvy and allied diseases from the list of nautical horrors, but also placed within the reach of the sea-farer means of even luxurious living. These are eminent achievements in these directions, and now inquiry is busy to devise better means for ventilation, to vouchsafe more air and light to the denizens of nautical habitations.

The time has not yet arrived that we may control the hygienic conditions surrounding the aquatic as we do those of the terrestrial abodes of man. This difficulty arises from the differences in the nature of the constructions and their physical surroundings, between which there is such a necessary relation that, to prevent danger to life, the nautical construction must be made to conform to them without paramount regard either to the health or comfort of the human beings upon it, which must ever be less easily maintained at sea. The shore habitation is in a measure independent of the physical surroundings that militate against healthful existence. Spacious and stable rooms with breathing walls and ample inlets and outlets for fresh air that can be kept open in all weathers, without danger of being swamped with salt water or deluged by rain, constitute the chief advantages of terrestrial habitations.

There are various ways by which it is endeavored to secure a movement of the air on shipboard; through the hatches and air-ports, aided by windsails and ventilating tubes running through the decks; by taking advantage of the inequality between the warmer and lighter air below decks and the cooler and heavier air externally. The distribution of air is very imperfect under these simple conditions, and frequent efforts have been made to supplement the natural draughts by mechanical contrivances, the primitive form of which consists of a fan inclosed in a suitable box, turned by a crank, a canvas tube connecting the machine with the apartments below decks which are to be ventilated. This apparatus is inefficient both as possessing little power and the impossibility of its being kept going for prolonged periods. Again, the foul air may be withdrawn from below by aspiration, the fresh air rushing in by the various available apertures and crevices always present. This plan is made applicable by causing draughts by various mechanical contrivances; tubes running through the decks and terminating externally in hoods of different patterns and with or without fans, the revolution of which causes an upward current; or, the foul air may be removed by pumps connected with a system of tubes terminating in the apartments below. A current may also be originated in the tubes by rarifying the air by means of heat or steam.

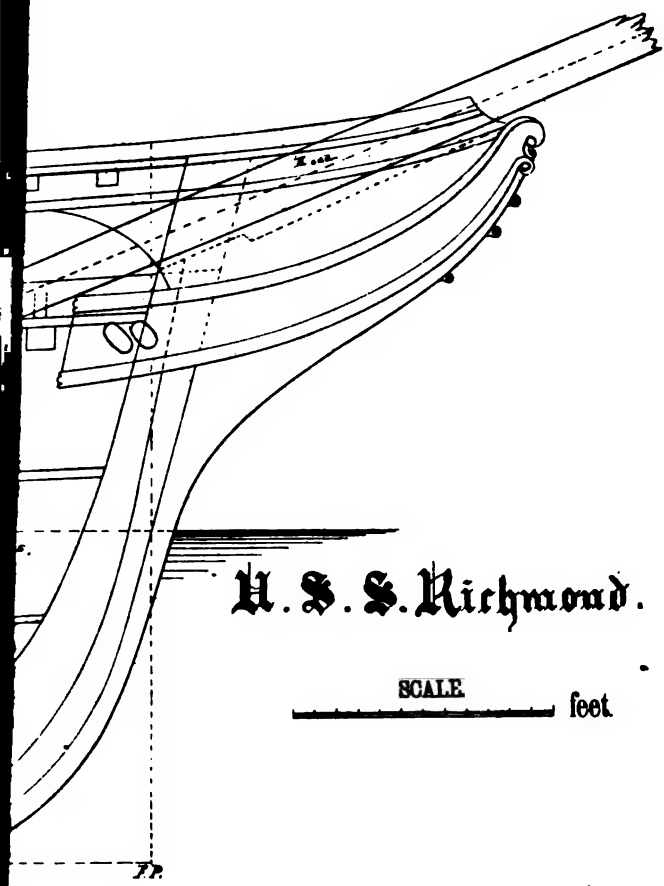
Ventilating tubes with hoods and fans furnish a simple device which will work satisfactorily on a small scale, but they are not of practical adaptation to ships of war. This plan had a limited trial on the United States steamer Tallapoosa a short time ago, and the conclusion was arrived at that its use would entail more expense than its utility and advantage would justify. On the same vessel another plan was also

put to practical test; this consisted of a large tube attached to the rudder, extending below the water line and connected with the interior of the ship by tubes of small diameter, the water acting in the rud tube with every pitch of the ship, like the piston of a pump. This apparatus would be useless in port, or in calm weather, at the very times when fresh air is needed; besides its cost is considerable. It has been suggested that the same sort of contrivance should be placed on the sides of the ship and to utilize the rolling motion of the vessel, but the same objections apply equally as in the former case.

Upwards of a century and a quarter ago the celebrated Dr. Mead published an account of a method of ventilating ships, devised by James Sutton, of Edinburgh, which consisted in a system of tubes terminating in a large main running to the ash-pit of the galley where the rarefied effects of heat could be utilized.

These are the chief methods that have been suggested and tested in one form or another, and all have been found not to fulfill all the desirable conditions of nautical ventilation. Impressed with this fact, the Department, on the 20th March, 1878, ordered a board composed of intelligent officers of the different branches of the service "to examine and ascertain the best system of ventilation, mechanical or otherwise, which ships of the Navy may be more perfectly ventilated"; the subject was quite thoroughly considered, and the result of their deliberations was the adoption of the system now in use on board the United States steamer Richmond, flag-ship of the Asiatic squadron. The method which is illustrated by the annexed diagram is based on the aspirator plan, by means of a net-work of tubes reaching every part of the ship, and terminating in a large main through which the currents are drawn by a steam blower, thus changing the entirety of air within the ship; or the current may be reversed and the air driven into the interior. This movement may be utilized in disinfecting, by means of chemical substances in a vaporous state, or by superheated steam. The success of the plan is pretty well assured by the favorable reports contained in the letters. The official reports, which embrace atmospheric examinations covering two quarters, are too few to authorize comparison with observations made on other ships not provided with the ventilator. The graphic trace herewith appended exhibits a summary of the observations made up to the present time.

It may be mentioned, however, in this connection that the demonstration of the advantages of any system of ventilation by physical observations is surrounded by peculiar difficulties. The dangerous element in air vitiated by overcrowding is the organic exhalations of the lungs, skin, and there exists at present no ready, easy, and reliable method of estimating its quantity. It has been assumed that, as this organic matter and carbon dioxide are at the same time products of the same changes, the amount of the latter in the air may be regarded as a gauge of the former. This assumption would, perhaps, be unobjectionable, were it not the case that grave errors may creep into the calculation by reason of the possible accidental presence of this agent in the air from other than vital sources; or the methods may be lacking in uniformity and exactness. This important question has been referred to competent officers for thorough examination. I am strongly impressed, however, with the belief that the United States steamer Richmond is a successful success as far as ventilation goes, and this belief is strengthened by the present testimony of the officers, who live below decks, and have no doubt of the purity of the air from the character of their sensations when the hatches were closed in tempestuous weather.



U. S. S. Richmond.

SCALE _____ feet

This system of ventilation is not expensive when its efficiency is considered; of course, it requires a great deal of alteration in a finished ship to locate a sufficient number of pipes in proper position; for instance, its introduction on board the United States steamer Richmond involved an expense of \$16,000. It is, however, an admitted fact, that judicious expenditures looking towards the improvement of the health of the national forces, or the prevention of disease in communities is true economy, though the first outlay might seem large. This fact has already been demonstrated in the Navy by diminished sick-lists, fewer expensive medical surveys, and lessened pension-roll, as the sanitary surroundings of the sailor have been improved, and his food, water, and air brought up to a higher standard of quantity and quality.

It would, therefore, be a measure of the highest wisdom to introduce these important reforms into new ships, and into all the old ones when undergoing repairs.

While the indispensable necessity for pure air is so urgent on ship-board, it is no less a matter of great concern to secure an abundant supply of sunlight. The plan hitherto pursued of piercing the sides of the ship with small round air-ports does not answer the important object. The department wisely decided in the case of the United States steamer Richmond to substitute large ports, fitted with hinged doors, which, at the same time improving the illumination, supplied, when opened, admirable fresh-air adits. The influence of a stream of sunlight upon the physical and mental welfare of the occupants of the hitherto small, damp, and dark rooms of our naval ships will be manifested in the maintenance of a higher health standard among officers and men, and also the possession of more cheerful manners and evenness of temper—qualities so essential to the happiness and thorough efficiency of all ships' companies. The adoption of the Wilson port in all of our vessels when being repaired is, therefore, recommended as an important sanitary measure.

As remarked above, it is impossible to secure the same comfort, and as full control over the conditions of sanitation on sea as on land, for those who are in health. How much more difficult it is to provide for the sick. It has been the custom to assign a certain portion of the ship to the use of the sick and wounded, and usually the place selected is located in the forward part, and though they are perhaps here most out of the way, yet a worse place could not be selected, for it is the place of all others which combines most of the disadvantages of ship-life—dampness, motion, least air and light, and most noise. For these reasons it would be far preferable to locate the sick-quarters somewhere in the waist of the ship, although, perhaps, the selection of the place must be determined for each ship as now finished, yet it is certain that, by the exercise of sound judgment and intelligent foresight, much amelioration in this particular can be effected while the ship is under construction; for, cut off, as the mariner is, from home and friends, in foreign lands, it requires a stouter *morale* to resist the depressing influences of disease, and when sick to bear up under it, than when surrounded by the cheering influences of home. It is, therefore, desirable to furnish them, as far as circumstances will permit, with every comfort and convenience procurable on shipboard.

The frequent infection of our ships in tropical ports where epidemic diseases and notably yellow fever prevail demands the earnest consideration of the department. It has happened, in spite of the closest attention to hygienic regulations, that yellow fever has gained a footing among the crews of vessels and raged with such violence, that nothing short of immediate departure for a northern climate sufficed to stamp it

out. The vessels have to be laid up for a winter or so in expectation that severe cold will destroy the germs of the disease, but unfortunately there exist grave doubts of this ever being the fact; at least, it has not proved successful in certain recent instances, for the return of the vessels to the tropics, as in the cases of the Plymouth and Susquehanna, was attended with a new outbreak. These and other examples show that disease germs in general, and yellow-fever germs in particular, may have their development checked or their activity abated, but are not destroyed by even low temperatures. As far as experimental research on a small scale proves anything, heat is shown to be a far more potent agent of destruction to germ life than cold. The practical difficulties of applying heat on a large scale are doubtless great, but the fact really is that experimentation in this way involves large expense, beyond the means of most private individuals, and, therefore, but little has, up to the present time, been done. The terrific affliction of this country by epidemic diseases has raised the subjects of the investigation of their origin and spread, and the discovery of the best means of counteracting and controlling them, to the importance of national questions, to be worked out under government auspices. Successful and reliable means of disinfecting ships speedily would be an immense gain both to the Navy and to the commercial marine, and would protect communities from the importation of epidemics, which destroy in a few months valuable lives, and cause the loss of vast wealth. For the above-stated purpose, the establishment of a station on our Northern coast would be desirable, where vessels attacked by infectious diseases might resort, the officers and crew transferred to suitable buildings on shore, the sick properly cared for, while the rest of the men could dismantle the vessel and thoroughly cleanse and disinfect her. In this manner, in a few days, the vessel would be ready for service, without any fear being entertained of a recurrence of the disease. While the station would thus be serving the necessities of immediate use, experimentation on the subject of disinfection might be carried on by trained medical officers of the Navy, who are so well calculated by their experience and abilities for this work. I am convinced that the valuable information and experience thus obtained would soon repay the nation for the outlay incurred in establishing the station, and I would therefore solicit your active exertions in securing an appropriation for this purpose. I estimate the cost of the ground, the erection of suitable buildings, and the purchase of machinery and disinfectants to be \$65,000.

HOSPITALS.

The hospital at Norfolk, Va., is now being put in good repair. The hurricane which prevailed in that vicinity last August damaged the buildings and grounds to such an extent as to require the expenditure of \$3,999. This institution is now being furnished with a steam-heating apparatus, which, when complete, will supply a long-needed improvement, and at the same time elevate it to the rank of one of the best equipped hospitals in the country.

The hospital at Annapolis has been abandoned, as the building used for quartering the sick inside the walls of the Academy affords abundant space for all its wants, and it would only be on occasions of epidemic disease that any greater hospital accommodation would be necessary, and this necessity could be easily met in such cases by the erection of temporary structures. A considerable expense is incurred every year in caring for the building and grounds, and the former is gradually falling into decay with disuse, so that, in my opinion, the interests of the

government would be best served by disposing of it and turning the proceeds over to the hospital fund, the resources of which are now strained to provide for hospitals actually needed.

The hospital at Mare Island, California, has been by judicious expenditure kept up to that standard of efficiency which the growing necessities of that station absolutely demand. The available space for accommodating any material increase of the number of patients is, however, greatly restricted by the medical officers being quartered in the building; a state of affairs which should not exist. I would, therefore, earnestly call your attention to the pressing necessity that exists of putting up quarters for the medical staff in the hospital grounds. Suitable buildings could be erected for this purpose at a cost of \$15,000.

INSANE OF THE NAVY.

On the 30th September, 1878, there remained under treatment in the Government Hospital for the Insane—

Two commanders, 2 lieutenant-commanders, 2 first assistant engineers, 1 late ensign, 10 seamen, 2 ordinary seamen, 2 ordinary seamen extra, 1 seaman extra fireman, 1 late seaman, 7 landsmen, 9 marines, 3 beneficiaries, 1 second-class boy.	
Total	43
Admitted during the year ending September 30, 1879: 1 past assistant surgeon, 1 gunner's mate, 4 seamen, 1 seaman extra fireman, 3 landsmen, 1 marine	11
Total number under treatment	54
Discharged during the year ending September 30, 1879: 1 gunner's mate, 3 seamen, 1 ordinary seaman, 1 ordinary seaman extra, 1 seaman extra fireman, 2 landsmen, 3 marines, 1 beneficiary. Total	13
Remaining at the end of the year: 2 commanders, 2 lieutenant-commanders, 1 passed assistant surgeon, 2 first assistant engineers, 1 late ensign, 11 seamen, 1 ordinary seaman, 1 ordinary seaman extra, 1 seaman extra fireman, 8 landsmen, 7 marines, 2 beneficiaries, 1 late seaman, 1 second-class boy. Total	41

NAVAL HOSPITAL FUND.

The condition of this fund is as follows:

Balance on hand October 1, 1878	\$47,746 25
Transferred to the credit of the fund in settlement of accounts by the Fourth Auditor from October 1, 1878, to October 1, 1879	74,226 57
Credit by appropriation for the fiscal year ending June 30, 1880	50,000 00
Total	172,072 82
Deduct amount of expenditures from October 1, 1878, to October 1, 1879 ..	106,045 66
Balance on hand October 1, 1879	66,027 16

Very respectfully, your obedient servant,

PHILIP S. WALES,
Surgeon-General, U. S. N.

Hon. R. W. THOMPSON,
Secretary of the Navy.

*Estimates of appropriations required for the service of the fiscal year ending June 30, 1881
by the Bureau of Medicine and Surgery.*

Detailed objects of expenditure and explanations.	Estimated amount which will be required for each detailed object of expenditure.	Amount appropriated for the current fiscal year ending June 30, 1880.
SALARIES.		
For one chief clerk (21 Stat. at L., p. 24, sec. 1; Rev. Stats., p. 70, sec. 416) . . .	\$1,600 00	
For one clerk class three (21 Stat. at L., p. 24, sec. 1; Rev. Stats., p. 26, sec. 167) .	1,600 00	
For one clerk (21 Stat. at L., p. 24, sec. 1)	1,000 00	
For one assistant messenger (21 Stat. at L., p. 24, sec. 1)	720 00	
For one laborer (21 Stat. at L., p. 24, sec. 1)	660 00	
	4,780 00	4,780 00
CONTINGENT EXPENSES.		
For stationery and miscellaneous items (21 Stat. at L., p. 24, sec. 1)	100 00	100 00
MEDICAL DEPARTMENT.		
For support of the medical department for surgeons' necessaries for vessels in commission, navy-yards, naval stations, Marine Corps, and Coast Survey (appropriated February 14, 1879, 20 Stat. at L., p. 288, sec. 1)	45,000 00	45,000 00
NAVAL HOSPITAL FUND.		
For maintenance of the naval hospitals at Portsmouth, N. H., Boston, Mass., Brooklyn, N. Y., Philadelphia, Pa., Annapolis, Md., Washington, D. C., Norfolk, Va., Pensacola, Fla., Mare Island, Cal., and Yokohama, Japan (appropriated February 14, 1879, 20 Stat. at L., p. 288, sec. 1)	50,000 00	50,000 00
CONTINGENT.		
For contingent expenses of the bureau: For freight on medical stores, transportation of insane patients, advertising, telegraphing, purchase of books, expenses attending the medical boards of examiners, purchase and repair of harness and wagons, purchase and feed of horses and cows, trees, garden tools, and seeds (appropriated February 14, 1879, 20 Stat. at L., p. 288, sec. 1) .	15,000 00	15,000 00
REPAIRS, MEDICINE AND SURGERY.		
For repairs to naval laboratory, naval hospitals and appendages, including roads, outhouses, sidewalks, fences, gardens, farms, cemeteries, &c. (appropriated February 14, 1879, 20 Stat. at L., p. 288, sec. 1)	30,000 00	30,000 00
CIVIL ESTABLISHMENT.		
For pay of employes at the several naval hospitals, navy-yards, naval laboratory, and Naval Academy, under the cognizance of the Bureau of Medicine and Surgery (appropriated February 14, 1879, 20 Stat. at L., p. 288, sec. 1) . .	40,000 00	40,000 00

STATISTICAL REPORT ON THE HEALTH OF THE NAVY, ETC., FOR THE YEAR 1878.

Naval hospital, Chelsea, Mass.

AGGREGATE, 1878.

(Total number of sick-days, 6,657. Deaths, 7: Paralysis, 1; bronchitis, ac., 1; phthisis pneum., chr., 2; pneumonia, 1; contusio, 1; syphilis, prim., 1.)

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic	1	2	3				
Enthetic	1	8	6	1		1	1
Dietic		1	1				
Diathetic	5	10	8	3			4
Developmental							
Tubercular		1					1
Parasitic							
Of the nervous system	3	7	4	3		1	2
eye							
ear							
teeth							
circulatory system	6	1	2	5			5
respiratory system	6	14	9	1	1	4	1
digestive system	1	11	8	2	1		1
urinary and genital system	2	2	2	1			1
locomotive system		8	1				2
integumentary system	1	5	4	1			1
Non-malignant tumors and cysts							
Total diseases	26	65	48	17	2	6	18
Wounds, injuries, and accidents	1	9	4	2	2	1	1
Total	27	74	52	19	4	7	19

Naval hospital, New York.

AGGREGATE, 1878.

(Total number of sick-days, 23,174. Deaths, 10: Febris flava, 3; phthisis pneumon., chr., 1; cholera morbus, 1; tuberculosis, 1; pneumonia, 1; cirr. hepatis, 1; albuminuria, 2.)

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic	2	13	9	2		3	1
Enthetic	8	32	19	11	1		9
Dietic	1	1	1				
Diathetic	7	40	20	20			7
Developmental							
Tubercular	1					1	
Parasitic		2	2				
Of the nervous system		22	4	13	2		3
eye	3	14	7	6			4
ear	2		1	1			
teeth							
circulatory system	3	9	2	9			1
respiratory system	7	34	8	22	3	2	6
digestive system	3	20	13	8			
urinary and genital system	3	23	11	7		1	7
locomotive system		3	2	1			
integumentary system	2	11	9	1		1	2
Non-malignant tumors and cysts		1	1				
Total diseases	42	224	109	101	6	16	40
Wounds, injuries, and accidents	6	41	22	17			8
Total	48	265	131	118	6	16	48

Naval hospital, Philadelphia, Pa.

AGGREGATE, 1878.

[Total number of sick-days, 10,151. Deaths, 12: Morbi valv. cordis, 2; febris typhus, 1; epilepsia, 1; phthisis pul., chr., 1; contusio, 1; cirrhosis hepatis, 1; hydrops., 1; aneurysma, 1; senectus, 1; adynamia, 2; paralysis, 1.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic.....		15	8			1	6
Enthetic.....	3	11	9	3			3
Dietic.....	2	18	18				2
Diathetic.....	2	25	14	1		3	9
Developmental.....		2				1	1
Tubercular.....							
Parasitic.....							
Of the nervous system.....	3	13	5		2	2	7
eye.....		1	1				
ear.....							
teeth.....							
circulatory system.....	1	4	2	1		2	
respiratory system.....	7	17	17	1		1	5
digestive system.....	3	19	17		1	1	3
urinary and genital system.....	1	3	2	1			1
locomotive system.....	1		1				
integumentary system.....		7	5				2
Non-malignant tumors and cysts.....							
Total diseases.....	23	135	99	7	3	11	38
Wounds, injuries, and accidents.....	3	17	11	1		1	7
Total.....	26	152	110	8	3	12	45

Naval hospital, Washington, D. C.

AGGREGATE, 1878.

[Total number of sick-days, 4,228. Deaths, 3: Febris interica, 1; pneumonia, 1; phthisis pneu. chr., 1.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic.....		14	12			1	1
Enthetic.....	1	11	6	1	1		4
Dietic.....		2	1				
Diathetic.....	3	5	6	2	1		
Developmental.....							
Tubercular.....		1					1
Parasitic.....							
Of the nervous system.....	1	3	2	1			1
eye.....		1	4				
ear.....							
teeth.....		1	1	1			1
circulatory system.....		3	3	1			1
respiratory system.....	2	26	13	4		2	9
digestive system.....	4	11	12	1			2
urinary and genital system.....		8	7	1			
locomotive system.....		1	1				
integumentary system.....	1	8	6	1			2
Non-malignant tumors and cysts.....		2	2				
Total diseases.....	12	97	70	13	2	3	21
Wounds, injuries, and accidents.....	1	8	7	1			1
Total.....	13	105	77	13	2	3	22

Naval hospital, Norfolk, Va.

AGGREGATE, 1878.

[Total number of sick-days, 12,400. Deaths, 3: Asthma, 1; bronch., chr., 1; hypertropia cordis, 1.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic.....	3	10	10	1	.....	.....	2
Enthetic.....	5	24	18	9	.....	.....	2
Dietic.....	.....	.....	.....	.....	.....	.....	.....
Diathetic.....	5	23	15	7	.....	.....	6
Developmental.....	.....	1	.....	.....	.....	.....	1
Tubercular.....	.....	.....	.....	.....	.....	.....	.....
Parasitic.....	.....	.....	.....	.....	.....	.....	.....
Of the nervous system.....	1	11	5	4	2	.....	1
eye.....	1	2	1	1	.....	.....	1
ear.....	.....	1	.....	.....	.....	.....	1
teeth.....	.....	.....	.....	.....	.....	.....	.....
circulatory system.....	1	7	1	2	1	1	3
respiratory system.....	8	24	8	6	4	2	12
digestive system.....	4	7	6	2	.....	.....	1
urinary and genital system.....	3	11	9	1	2	.....	2
locomotive system.....	1	1	1	.....	.....	.....	1
integumentary system.....	4	8	8	2	.....	.....	2
Non-malignant tumors and cysts.....	.....	.....	.....	.....	.....	.....	.....
Total diseases.....	36	180	82	35	11	3	35
Wounds, injuries, and accidents.....	10	10	7	10	1	.....	2
Total.....	46	140	89	45	12	3	37

Naval hospital, Pensacola, Fla.

AGGREGATE, 1878.

[Total number of sick-days, 606.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic.....	.....	1	1	.....	.....	.....	.....
Enthetic.....	.....	.....	.....	.....	.....	.....	.....
Dietic.....	.....	.....	.....	.....	.....	.....	.....
Diathetic.....	1	.....	1	.....	.....	.....	.....
Developmental.....	.....	.....	.....	.....	.....	.....	.....
Tubercular.....	.....	.....	.....	.....	.....	.....	.....
Parasitic.....	.....	.....	.....	.....	.....	.....	.....
Of the nervous system.....	.....	.....	.....	.....	.....	.....	.....
eye.....	.....	.....	.....	.....	.....	.....	.....
ear.....	.....	.....	.....	.....	.....	.....	.....
teeth.....	.....	.....	.....	.....	.....	.....	.....
circulatory system.....	.....	.....	.....	.....	.....	.....	.....
respiratory system.....	.....	2	.....	1	.....	.....	1
digestive system.....	2	.....	1	1	.....	.....	.....
urinary and genital system.....	.....	.....	.....	.....	.....	.....	.....
locomotive system.....	.....	.....	.....	.....	.....	.....	.....
integumentary system.....	.....	.....	.....	.....	.....	.....	.....
Non-malignant tumors and cysts.....	.....	.....	.....	.....	.....	.....	.....
Total diseases.....	3	3	3	2	.....	.....	1
Wounds, injuries, and accidents.....	1	.....	.....	1	.....	.....	.....
Total.....	4	3	3	3	.....	.....	1

Naval hospital, Mare Island, Cal.

AGGREGATE, 1878.

[Total number of sick-days, 12,777. Deaths, 5: Cerebritis, 1; meningitis, 1; erysipilas, 1; aneurism in aorta, 1.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic.....		13	10	2		1	
Enthetic.....	4	13	13	1			
Dietic.....		4	3		1		
Diathetic.....	7	7	13				1
Developmental.....							
Tubercular.....							
Parasitic.....							
Of the nervous system.....	3	7	5	2	1	2	6
eye.....		4	1				3
ear.....		3		1	1		1
teeth.....		2		1		2	
circulatory system.....	3	2	2	1			
respiratory system.....	4	24	17	1			3
digestive system.....	7	7	9	4	2		
urinary and genital system.....	3	8	4	3	1		3
locomotive system.....		2	1		1		
integumentary system.....	2	3	5				
Non-malignant tumors and cysts.....							
Total diseases.....	39	97	83	15	8	5	52
Wounds, injuries, and accidents.....	2	12	8	4	1		1
Total.....	41	109	91	19	9	5	53

Naval hospital, Yokohama, Japan.

AGGREGATE, 1878.

[Total number of sick-days, 2,410; deaths, 2; luxatio cubiti, 1; phthisis, pul. chron., 1.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic.....		1					1
Enthetic.....	1	7	4		3		1
Dietic.....							
Diathetic.....	1	9	4		2		4
Developmental.....							
Tubercular.....							
Parasitic.....							
Of the nervous system.....		2			1		1
eye.....		1	1				
ear.....							
teeth.....			2				
circulatory system.....		2	3				
respiratory system.....	1	4	3		1	1	
digestive system.....		5	2				3
urinary and genital system.....		6	5		1		
locomotive system.....							
integumentary system.....		1	1				
Non-malignant tumors and cysts.....							
Total diseases.....	3	38	22		8	1	10
Wounds, injuries, and accidents.....	2	5	2		4	1	
Total.....	5	43	24		12	2	10

Naval hospitals.

AGGREGATE, 1878.

[Number of cases treated, 1,098; number of sick-days, 72,403; deaths, 42.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic.....	6	69	53	5		6	11
Enthetic.....	23	106	75	26	5	1	22
Dietic.....	3	25	24		2		2
Diathetic.....	31	119	81	38	2	3	31
Developmental.....		3				1	2
Tubercular.....	1	2				1	2
Parasitic.....		2	2				
Of the nervous system.....	17	65	25	23	8	5	21
eye.....	4	22	11	8	1		6
ear.....	2	2	2	1			1
teeth.....		1		1			
circulatory system.....	14	28	12	19	1	5	5
respiratory system.....	35	145	75	36	11	12	46
digestive system.....	24	80	68	18	5	3	10
urinary and genital system.....	12	61	40	14	4	1	14
locomotive system.....	2	10	7	1	1		3
integumentary system.....	10	43	38	5		1	9
Non-malignant tumors and cysts.....		8	3				
Total diseases.....	184	786	516	190	40	39	185
Wounds, injuries, and accidents.....	26	102	61	35	9	3	20
Total.....	210	888	577	225	49	42	205

Navy-yard, Portsmouth, N. H., 1878.

[Total number of sick-days, 1,251; daily average sick-days, 34.1; deaths, 2.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic.....							
Enthetic.....	1	8	7	1			1
Dietic.....							
Diathetic.....		9	7	1			1
Developmental.....							
Tubercular.....							
Parasitic.....							
Of the nervous system.....		1			1		
eye.....							
ear.....							
teeth.....		1	1				
circulatory system.....							
respiratory system.....	1	11	11			1	
digestive system.....		14	13	1			
urinary and genital system.....	1	2	2			1	
locomotive system.....							
integumentary system.....		5	5				
Non-malignant tumors and cysts.....							
Total diseases.....	3	51	46	3	1	2	2
Wounds, injuries, and accidents.....		8	5	2			1
Total.....	3	59	51	5	1	2	3

* Of catarrh—admitted with and died of glossitis of erysipelatous character.

Navy-yard, Boston, Mass., 1878.

[Total number of sick-days, 965; daily average sick, 2.33; deaths, 1.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic.....		10	8		2		
Enthetic.....	1	11	8		3		
Dietic.....	1	7					
Diathetic.....		17	12		5		
Developmental.....							
Tubercular.....							
Parasitic.....							
Of the nervous system.....		6	5		1		
eye.....		1	1				
ear.....							
teeth.....							
circulatory system.....		4	3			1	
respiratory system.....	1	20	18		3		
digestive system.....		22	19		4		
urinary and genital system.....		3	2		1		
locomotive system.....							
integumentary system.....		12	12				
Non-malignant tumors and cysts.....		2	2				
Total diseases.....	3	115	98		19	1	
Wounds, injuries, and accidents.....		28	24		2		2
Total.....	3	143	122		21	1	2

*Aneurism.

Navy-yard, New York, 1878.

[Total number of sick-days, 278; daily average sick, 1.1.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic.....		9	9				
Enthetic.....							
Dietic.....		2	2				
Diathetic.....							
Developmental.....							
Tubercular.....							
Parasitic.....							
Of the nervous system.....		7	6		1		
eye.....		1	1				
ear.....							
teeth.....							
circulatory system.....		1	1				
respiratory system.....		9	9				
digestive system.....		1	1				
urinary and genital system.....							
locomotive system.....		1			1		
integumentary system.....							
Non-malignant tumors and cysts.....							
Total diseases.....		31	29		2		
Wounds, injuries, and accidents.....		5	5				
Total.....		36	34		2		

Navy-yard, League Island, 1878.

[Total number of sick-days, 604; daily average sick, 13½.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic.....		30	23		7		
Euthetic.....		11	5		6		
Dietic.....		8	7		1		
Diathetic.....		5	3				
Developmental.....		1			1		
Tubercular.....							
Parasitic.....							
Of the nervous system.....							
eye.....		2	2				
ear.....							
teeth.....		1	1				
circulatory system.....		6	4		2		
respiratory system.....		21	18		3		
digestive system.....		1	1				
urinary and genital system.....							
locomotive system.....		3	1		2		
integumentary system.....							
Non-malignant tumors and cysts.....							
Total diseases.....		89	85		24		
Wounds, injuries, and accidents.....		9	8		1		
Total.....		98	73		25		

Navy-yard, Washington, 1878.

[Total number of sick-days, 1,279; daily average sick, 34½.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic.....	1	79	74		6		
Euthetic.....		10	8		2		
Dietic.....		7	7				
Diathetic.....	1	15	15		1		
Developmental.....							
Tubercular.....							
Parasitic.....							
Of the nervous system.....		16	15				1
eye.....		1	1				
ear.....		1					1
teeth.....		2	2		1		
circulatory system.....		1	1				
respiratory system.....	1	30	20		8		3
digestive system.....		28	24		4		
urinary and genital system.....		12	7	1	4		
locomotive system.....		1			1		
integumentary system.....		11	11				
Non-malignant tumors and cysts.....		2	2				
Total diseases.....	3	216	187	1	26		5
Wounds, injuries, and accidents.....		23	20		2		1
Total.....	3	239	207	1	28		6

Navy-yard, Norfolk, Va., 1878.

[Total number of sick-days, 1,223; daily average sick, 34.4.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic.....		42	38		4		
Enthetic.....		21	19		2		
Dietic.....		4	3		1		
Diathetic.....	1	22	20	1	2		
Developmental.....							
Tubercular.....							
Parasitic.....							
Of the nervous system.....		12	12				
eye.....		4	3		1		
ear.....							
teeth.....		1					
circulatory system.....		1			1		
respiratory system.....	1	15	12		3		1
digestive system.....		45	44		1		
urinary and genital system.....		1			1		
locomotive system.....							
integumentary system.....		14	10		4		
Non-malignant tumors and cysts.....		2	2				
Total diseases.....	2	183	163	1	20		1
Wounds, injuries, and accidents.....		24	22				2
Total.....	2	207	185	1	20		3

Navy-yard, Pensacola, Fla., 1878.

[Total number of sick-days, 202; daily average sick, 33.4.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic.....		3	3				
Enthetic.....							
Dietic.....		3	3				
Diathetic.....							
Developmental.....							
Tubercular.....							
Parasitic.....							
Of the nervous system.....							
eye.....							
ear.....							
teeth.....							
circulatory system.....							
respiratory system.....		3	3				
digestive system.....		2	2				
urinary and genital system.....							
locomotive system.....							
integumentary system.....							
Non-malignant tumors and cysts.....							
Total diseases.....		11	11				
Wounds, injuries, and accidents.....		2	2				
Total.....		13	13				

Navy-yard, Mare Island, Cal., 1878.

[Total number of sick-days, 1,407; daily average sick, 33½.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic.....		5	5				
Enthetic.....		3	1		1		
Dietic.....		1	1		1		
Dysthetic.....		4	2		1		1
Developmental.....							
Tubercular.....							
Parasitic.....							
Of the nervous system.....		4	3		1		
eye.....		1	1				
ear.....							
teeth.....		1		1			
circulatory system.....	2	10	5	1			1
respiratory system.....		5	4		1		2
digestive system.....		2	2				1
urinary and genital system.....		2	2				
locomotive system.....		2	2				
integumentary system.....							
Non-malignant tumors and cysts.....							
Total diseases.....	2	43	33	2	5		5
Wounds, injuries, and accidents.....		12	11		1		
Total.....	2	55	44	2	6		5

Naval Academy, Annapolis, Md., 1878.

[Total number of sick-days, 4,545; daily average sick, 12½.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic.....	1	144	144				1
Enthetic.....		10	9				1
Dietic.....		5	5				
Dysthetic.....	1	27	27				1
Developmental.....							
Tubercular.....							
Parasitic.....		2	2				
Of the nervous system.....	2	180	191				
eye.....	2	22	20	1	3		
ear.....		5	5				
teeth.....		21	21				
circulatory system.....		7	7				
respiratory system.....	2	62	62		2		
digestive system.....	2	300	300				2
urinary and genital system.....		8	8				
locomotive system.....		7	7				
integumentary system.....	1	47	45		1		2
Non-malignant tumors and cysts.....							
Total diseases.....	11	856	853	1	6		7
Wounds, injuries, and accidents.....	8	146	148		1		5
Total.....	19	1,002	1,001	1	7		12

Naval Torpedo Station, Newport, R. I., 1878.

[Total number of sick-days, 688; daily average sick, 1.111.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic		4	4				
Enthetic		1	1				
Dietic		12	11				1
Diathetic							
Developmental							
Tubercular							
Parasitic							
Of the nervous system		5	5				
eye		2	2				
ear							
teeth							
circulatory system							
respiratory system		6	6				
digestive system		21	21				
urinary and genital system		1	1				
locomotive system							
integumentary system		4	3				1
Non-malignant tumors and cysts							
Total diseases		56	54				2
Wounds, injuries, and accidents		17	15				2
Total		73	69				4

Marine Barracks, Brooklyn, N. Y., 1878.


[Average number of marines, 244; total number of sick-days, 2,752; death, 1; ratio per thousand of cases treated to effectives, 1,123 +.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic		23	21		1		
Enthetic	2	24	24				2
Dietic		9	9				
Diathetic		22	21				1
Developmental							
Tubercular							
Parasitic							
Of the nervous system		9	9				
eye		8	7		1		
ear		1	1				
teeth							
circulatory system		3	1		2		
respiratory system	2	32	34				
digestive system	1	68	68		1		2
urinary and genital system	1	3	2		2		
locomotive system							
integumentary system	1	18	18		1		
Non-malignant tumors and cysts		1	1				
Total diseases	7	220	214		8		5
Wounds, injuries, and accidents	2	45	45		1	*1	
Total	9	265	259		9	1	5

* Fracture sternal ribs, and laceratum of liver.

Marine Barracks, Washington, D. C., 1878.

Average number of marines, 164; total number of sick-days, 1,192; deaths, 1; ratio per thousand of cases treated to effectives, 1,312+.

Diseases.		Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic			26	24		1		1
Enthetic			3	2		1		1
Dietic			4	4				
Diathetic			20	16	1	3		
Developmental			1				*1	
Tubercular								
Parasitic								
Of the nervous system			11	9		2		
eye			3	3				
ear								
teeth			2					
circulatory system					1	1		
respiratory system			39	33		4		2
digestive system			56	47	1	8		
urinary and genital system								
locomotive system			2	2				
integumentary system			15	11		4		
Non-malignant tumors and cysts								
Total diseases			182	151	3	24	1	3
Wounds, injuries, and accidents			28	28				
Total			210	179	3	24	1	3

* Senectus.

Special duty attending naval officers in New York, 1878.

[Total number of sick-days, 1,249; daily average sick, 34 $\frac{1}{3}$; deaths, 2.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic		3	2				
Enthetic		1					1
Dietic	1	2	1				2
Diathetic							
Developmental							
Tubercular							
Parasitic							
Of the nervous system	1	4	1		1	*1	2
eye		1	1				
ear		1	1				
teeth							
circulatory system			7				
respiratory system	1	6					
digestive system		7	6			†1	
urinary and genital system	1		1				
locomotive system							
integumentary system		3	3				
Non-malignant tumors and cysts							
Total diseases	4	27	23		1	2	5
Wounds, injuries, and accidents		2	2				
Total	4	29	25		1	2	5

* Paralysis.

† Gastritis.

Special duty attending naval officers in Philadelphia, 1878.

[Total number of sick-days, 1,057; daily average sick, 23½.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic.....		8	8				
Enthetic.....							
Dietic.....		1			1		
Diathetic.....		1	1				
Developmental.....							
Tubercular.....							
Parasitic.....							
Of the nervous system.....	1	1	1				1
eye.....		3	3				
ear.....							
teeth.....							
circulatory system.....		1	1				
respiratory system.....		3	3				
digestive system.....		4	4				
urinary and genital system.....		2	1		1		
locomotive system.....							
integumentary system.....	1	4	4				1
Non-malignant tumors and cysts.....		1	1				
Total diseases.....	2	29	27		2		2
Wounds, injuries, and accidents.....		3	2		1		
Total.....	2	32	29		3		2

Special duty attending naval officers in Washington, D. C., 1878.

[Total number of sick-days, 4,684; daily average sick, 12¾; deaths, 1.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic.....	3	59	59				3
Enthetic.....		4	4				
Dietic.....	1	20	20				1
Diathetic.....							
Developmental.....							
Tubercular.....	1		1				
Parasitic.....							
Of the nervous system.....	3	11	13			*1	
eye.....		10	9				1
ear.....		4	3				1
teeth.....							
circulatory system.....		1	1				
respiratory system.....	4	38	40				2
digestive system.....	7	45	50				2
urinary and genital system.....	1	7	6				3
locomotive system.....							
integumentary system.....	6	11	16				1
Non-malignant tumors and cysts.....		1	1				
Total diseases.....	26	211	223			1	13
Wounds, injuries, and accidents.....	2	4	6				
Total.....	28	215	229			1	13

* Softening of the brain.

Navy yards and stations.

AGGREGATE, 1878.

[Total number of sick-days, 23,371; daily average sick, 74.44; deaths, 8.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic.....	5	443	422		21		5
Enthetic.....	4	105	88	1	15		5
Dietic.....	1	47	45		3		
Diathetic.....	5	181	160	3	15		8
Developmental.....		3	1			1	
Tubercular.....	1		1				
Parasitic.....		2	2				
Of the nervous system.....	7	276	270		7	2	4
eye.....	2	50	54	1	5		1
ear.....		12	10				2
teeth.....		23	23				
circulatory system.....		23	16	2	4	1	
respiratory system.....	15	277	250	1	22	1	9
digestive system.....	10	652	629	2	22	1	8
urinary and genital system.....	4	46	38	1	9	1	3
locomotive system.....		12	11		1		
integumentary system.....	9	150	141		13		5
Non-malignant tumors and cysts.....		9	9				
Total diseases.....	63	2,320	2,177	11	138	7	50
Wounds, injuries, and accidents.....	12	356	343	2	9	1	13
Total.....	75	2,676	2,520	13	147	8	63

Receiving-ship Wabash, Boston, Mass., 1878.

[Average number of ship's company, 332; total sick-days, 763; ratio per thousand of cases treated to effectives, 282 +.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic.....		3	3				
Enthetic.....	1	9	7		3		
Dietic.....		7	7				
Diathetic.....		2			2		
Developmental.....							
Tubercular.....		3	2		1		
Parasitic.....							
Of the nervous system.....		5	2	1	2		
eye.....							
ear.....							
teeth.....							
circulatory system.....							
respiratory system.....	1	14	10		5		
digestive system.....		10	10				
urinary and genital system.....		2	2				
locomotive system.....		1			1		
integumentary system.....		6	6				
Non-malignant tumors and cysts.....		1			1		
Total diseases.....	2	73	49	1	15		
Wounds, injuries, and accidents.....	1	18	15		3		1
Total.....	3	91	64	1	18		1

Receiving-ship Colorado, New York, 1878.

[Average number of ship's company, 305; total sick-days, 1,720; ratio per thousand of cases treated to effectives, 744 +.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic.....		25	17		8		
Enthetic.....		30	12	5	4		1
Dietic.....		13	10	1			
Diathetic.....		15	13		2		
Developmental.....							
Tubercular.....							
Parasitic.....							
Of the nervous system.....		10	6		2		
eye.....		2	1		1		
ear.....							
teeth.....							
circulatory system.....		2		1	1		
respiratory system.....	2	27	25	2	2		
digestive system.....		43	40		3		
urinary and genital system.....	1	7	2	2	4		
locomotive system.....		2	1		1		
integumentary system.....	1	17	14		1		3
Non-malignant tumors and cysts.....							
Total diseases.....	4	183	143	9	31		4
Wounds, injuries, and accidents.....	1	39	38		1		1
Total.....	5	222	181	9	32		5

Receiving-ship Saint Louis, Philadelphia, Pa., 1878.

[Average number of ship's company, 148; total sick-days, 812; deaths, 2; ratio per thousand of cases treated to effectives, 790 +.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic.....		21	20		1		
Enthetic.....	2	9	8		2		1
Dietic.....		6	6				
Diathetic.....		14	12		2		
Developmental.....							
Tubercular.....	1	1	2				
Parasitic.....							
Of the nervous system.....		2	1		1		
eye.....		1	1				
ear.....							
teeth.....							
circulatory system.....		2	2				
respiratory system.....		4	2		1	*1	
digestive system.....		20	17		3		
urinary and genital system.....		1	1				
locomotive system.....							
integumentary system.....		12	9		2		1
Non-malignant tumors and cysts.....							
Total diseases.....	3	93	81		12	1	2
Wounds, injuries, and accidents.....		20	13	1	5	†1	
Total.....	3	113	94	1	17	2	2

*Pneumonia.

†Submersio.

Receiving-ship Passaic, Washington, D. C., 1878.

[Average number of ship's company, 70; total sick-days, 50; ratio per thousand of cases treated to effectives, 100+.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic.....							
Ethnetic.....		1			1		
Dietic.....							
Diathetic.....		1	1				
Developmental.....							
Tubercular.....							
Parasitic.....							
Of the nervous system.....							
eye.....							
ear.....							
teeth.....							
circulatory system.....		1	1				
respiratory system.....							
digestive system.....		2	2				
urinary and genital system.....							
locomotive system.....							
integumentary system.....		1			1		
Non-malignant tumors and cysts.....							
Total diseases.....		6	4		2		
Wounds, injuries, and accidents.....		1	1				
Total.....		7	5		2		

Receiving-ship Franklin, Norfolk, Va., 1878.

[Average number of ship's company, 190; total sick-days, 1,366; deaths, 1; ratio per thousand of cases treated to effectives, 631+.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic.....		14	13				1
Ethnetic.....	1	14	10		2		5
Dietic.....		2	2				
Diathetic.....		5	5				
Developmental.....							
Tubercular.....							
Parasitic.....							
Of the nervous system.....		3	2		1		
eye.....		5	5				
ear.....							
teeth.....		2	1		1		
circulatory system.....		2	1				
respiratory system.....		10	6		3	1	
digestive system.....		9	7		2		
urinary and genital system.....		3	2		1		
locomotive system.....		1	1				
integumentary system.....		1	24				1
Non-malignant tumors and cysts.....							
Total diseases.....	2	92	78		10	1	5
Wounds, injuries, and accidents.....	1	25	22		2		2
Total.....	3	117	100		12	1	7

* Phthisis pulmon., chron.

Receiving-ship Independence, Mare Island, Cal., 1878.

[Average number of ship's company, 198; total sick-days, 1,432; ratio per thousand of cases treated to effectives, 1,202+.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic.....		38	30		8		
Enthetic.....		5	5				
Dietic.....		26	28		1		
Diathetic.....	1	18	16		3		
Developmental.....							
Tubercular.....							
Parasitic.....							
Of the nervous system.....		12	7		5		
eye.....		2			2		
ear.....							
teeth.....							
circulatory system.....							
respiratory system.....		40	27		13		
digestive system.....	1	21	16		6		
urinary and genital system.....		6	5		1		
locomotive system.....							
integumentary system.....		12	12				
Non-malignant tumors and cysts.....		2	1		1		
Total diseases.....	2	185	147		46		
Wounds, injuries, and accidents.....	1	50	46		4		1
Total.....	3	235	193		44		1

Receiving-ships.

AGGREGATE, 1878.

[Total number of ships' companies, 1,243; total sick-days, 6,143; deaths, 3; ratio per thousand of cases treated to effectives, 636+; ratio for 1877, 542+.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic.....		101	83		17		1
Enthetic.....	4	58	42	3	12		5
Dietic.....		57	53	1	3		
Diathetic.....	1	55	47		9		
Developmental.....							
Tubercular.....	1	4	4		1		
Parasitic.....							
Of the nervous system.....		32	20	1	11		
eye.....		10	7		3		
ear.....							
teeth.....							
circulatory system.....		7	4	1	2		
respiratory system.....	3	95	70	2	24	3	
digestive system.....	1	105	92		14		
urinary and genital system.....	1	19	12	2	6		
locomotive system.....		4	2		2		
integumentary system.....	3	71	65	4	4		5
Non-malignant tumors and cysts.....		2	1		1		
Total diseases.....	14	620	502	10	109	2	11
Wounds, injuries, and accidents.....	4	153	135	1	15	1	5
Total.....	18	773	637	11	124	3	16

NORTH ATLANTIC STATION.

The North Atlantic Station has the following geographical limits, viz: Within the latitudes of the banks of Newfoundland and the mouth of the Amazon River, embracing the longitudes of the Western and Madeira Islands.

The following vessels were employed on this station during the year: Powhatan, as flag-ship; Richmond (fourth quarter only), Plymouth, New Hampshire, Quinnebaug, Ossipee, Swatara, Enterprise, Fortune, Ajax, Catskill, Lehigh, Mahopac, Canonicus, Manhattan, Wyandotte, Montauk.

The ensuing tables present the groups of diseases and the cyclical changes in disease movement, as well as the aggregate of classified diseases, during each quarter and for the year.

During the first quarter miasmatic diseases and diseases of the digestive system were the same in numbers and greatest in frequency, both increasing during the second quarter, the latter class increasing nearly 30 per centum until the third quarter, when it decreased at about the same rate, and the former increased nearly 100 per centum, both classes decreasing in numbers during the fourth quarter.

Enthetic diseases were next in frequency during the first, second, and third quarters.

Respiratory diseases were greatest in frequency during the fourth quarter.

The deaths were: from drowning, 4; rheumatismus acutus, 1; febris flava, 10; pneumonia, 1; febris remittens, 1. Seven of the deaths from yellow fever occurred on board the Canonicus at New Orleans during the third quarter, and three in hospital at Santa Cruz, from the Plymouth, during the fourth quarter.

The health statistics of each vessel for the year are also appended.

The statistics, carefully kept, become of value in determining the health and sick rates of the various kinds and classes of vessels composing our Navy under different climatic conditions.

Powhatan, flag-ship, 2d rate. Wood; paddle; 2,182 tons.

[Employed during the year as flag-ship of the North Atlantic Station. Average number of ship's company, 323; total number of sick-days, 2,335; deaths, 0. Ratio per thousand of cases treated to effectives, 938 +.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic		34	31		3		
Enthetic	2	45	37		9		1
Dietic		10	10				
Diathetic		17	14		3		
Developmental							
Tubercular							
Parasitic		2	2				
Of the nervous system		11	6		5		
eye	1	7	8				
ear							
teeth							
circulatory system		1	1				
respiratory system		21	13		5		2
digestive system		63	57		4		2
urinary and genital system		7	5		2		
locomotive system							
integumentary system		23	21		2		
Non-malignant tumors and cysts							
Wounds, injuries, and accidents		62	56		6		
Total	3	303	261		39		

Richmond, 2d rate. Wood; screw; 2,000 tons.

[Employed during fourth quarter, 1878, on North Atlantic Station, at New York. Average number of ship's company, 336; total number of sick-days, 158; deaths, 0. Ratio per thousand treated to effectives, 95 +.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic.....		6	3		2		1
Enthetic.....		1					1
Dietic.....		1					1
Diathetic.....							
Developmental.....							
Tubercular.....							
Parasitic.....							
Of the nervous system.....		2	1		1		
eye.....		1	1				
ear.....							
teeth.....							
circulatory system.....							
respiratory system.....		13	12		1		
digestive system.....							
urinary and genital system.....		3	1				2
locomotive system.....							
integumentary system.....		2	1				1
Non-malignant tumors and cysts.....							
Wounds, injuries, and accidents.....		3	2				1
Total.....		32	21		4		7

Plymouth, 2d rate. Wood; screw; 1,122 tons.

[Employed during the year on the North Atlantic Station. Average number of ship's company, 230; total sick-days, 1,216; deaths, 3. Ratio per thousand of cases treated to effectives, 660 +.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic.....	3	23	21		1	3*	1
Enthetic.....		14	8		6		
Dietic.....		4	3		1		
Diathetic.....		8	4		4		
Developmental.....							
Tubercular.....							
Parasitic.....							
Of the nervous system.....		11	7		4		
eye.....		2	1		1		
ear.....							
teeth.....							
circulatory system.....							
respiratory system.....		28	22		4		2
digestive system.....		16	15				1
urinary and genital system.....		5	5				
locomotive system.....		1			1		
integumentary system.....		12	12				
Non-malignant tumors and cysts.....							
Wounds, injuries, and accidents.....		25	24		1		
Total.....	3	149	122		23	3	4

* Seven cases febris flava, 3 deaths.

New Hampshire, 2d rate. Wood; sails; 2,600 tons.

[Employed during the year on the North Atlantic Station, at Port Royal, S. C. Average number of ship's company, 138; total sick-days, 890; deaths, 0. Ratio per thousand of cases treated to effectives, 326 +.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic.....		7	7				
Enthetic.....		4	3		1		
Dietic.....							
Diathetic.....		4	3		1		
Developmental.....							
Tubercular.....							
Parasitic.....							
Of the nervous system.....		1	1				
eye.....							
ear.....							
teeth.....							
circulatory system.....							
respiratory system.....		4	2		2		
digestive system.....							
urinary and genital system.....		2	2				
locomotive system.....							
integumentary system.....		12	8				4
Non-malignant tumors and cysts.....							
Wounds, injuries, and accidents.....	1	11	8				4
Total.....	1	45	34		4		8

Quinnebaug, 3d rate. Wood; screw; 910 tons.

[Employed during the fourth quarter, 1878, on the North Atlantic Station. Average number of ship's company, 230; total sick-days, 373; deaths, 0. Ratio per thousand treated to effectives, 313 +.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic.....		13	9		3		1
Enthetic.....		2			1		1
Dietic.....		1	1				
Diathetic.....		2			2		
Developmental.....							
Tubercular.....							
Parasitic.....							
Of the nervous system.....		3	1		2		
eye.....		1	1				
ear.....		1			1		
teeth.....							
circulatory system.....		1			1		
respiratory system.....		13	4		2		7
digestive system.....		6	5		1		
urinary and genital system.....		3	2		1		
locomotive system.....		1	1				
integumentary system.....		7	6		1		
Non-malignant tumors and cysts.....							
Wounds, injuries, and accidents.....		18	15		2		1
Total.....		72	45		17		10

Ossipee, 3d rate. Wood; screw; 696 tons.

[Employed during first and second quarters on the North Atlantic Station. Average number of ship's company, 175; total sick-days, 270; deaths, 0. Ratio per thousand of cases treated to effectives, 142- $\frac{1}{2}$.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic		6	5		1		
Enthetic		1	1				
Dietic							
Diathetic		6	5		1		
Developmental							
Tubercular							
Parasitic							
Of the nervous system		1	1				
eye							
ear							
teeth							
circulatory system							
respiratory system		3	3				
digestive system							
urinary and genital system		2		1	1		
locomotive system		1	1				
integumentary system							
Non-malignant tumors and cysts							
Wounds, injuries, and accidents		5	4		1		
Total		25	20	1	4		

Swatara, 3d rate. Wood; screw; 910 tons.

[Employed during the year on the North Atlantic Station. Average number of ship's company, 160; total sick-days, 636; deaths, 0. Ratio per thousand of cases treated to effectives, 410- $\frac{1}{2}$.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic		5	5				
Enthetic		10	5		5		
Dietic		2			1		
Diathetic		5	2		3		
Developmental							
Tubercular							
Parasitic							
Of the nervous system		2			2		
eye		1			1		
ear							
teeth							
circulatory system							
respiratory system							
digestive system		27	22		5		
urinary and genital system							
locomotive system							
integumentary system		3	1		2		
Non-malignant tumors and cysts							
Wounds, injuries, and accidents		1	11	10	2		
Total		1	66	46	21		

Enterprise, 3d rate. Screw; 615 tons.

[Employed during the year on the North Atlantic Station. Average number of ship's company, 173; total sick-days, 1,013; deaths, 0. Ratio per thousand of cases treated to effectives, 676+.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic.....		27	26		1		
Euthetic.....		21	28		1		
Dietic.....		6	5				
Diathetic.....							
Developmental.....							
Tubercular.....							
Parasitic.....							
Of the nervous system.....		7	6		1		
eye.....		6	3		2		
ear.....							
teeth.....							
circulatory system.....		1			1		
respiratory system.....		3	1		1		1
digestive system.....		6	3		2		1
urinary and genital system.....		2	1		1		
locomotive system.....							
integumentary system.....		13	8		2		3
Non-malignant tumors and cysts.....							
Wounds, injuries, and accidents.....		25	23		2		
Total.....		116	94		14		8

Fortune, 4th rate. Screw; 306 tons.

[Employed during the year on the North Atlantic Station. Average number of ship's company, 32; total sick-days, 176; deaths, 0. Ratio per thousand of cases treated to effectives, 843+.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic.....	1	4	2		3		
Euthetic.....		1		1			
Dietic.....		1	1				
Diathetic.....	1	1	2				
Developmental.....							
Tubercular.....							
Parasitic.....							
Of the nervous system.....		1	1				
eye.....		3	1				
ear.....		1	1		1		
teeth.....							
circulatory system.....							
respiratory system.....		3	3				
digestive system.....		5	5				
urinary and genital system.....		1	1				
locomotive system.....							
integumentary system.....		1	1				
Non-malignant tumors and cysts.....							
Wounds, injuries, and accidents.....		4	4				
Total.....	2	25	22	1	4		

Ajax, 4th rate. Iron-clad; screw; 550 tons.

[Employed during the year on the North Atlantic Station. Average number of ship's company, 29; total sick-days, 233; deaths, 2. Ratio per thousand of cases treated to effectives, 900+.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic		8	7			*1	
Enthetic		3	3				
Dietic							
Diathetic							
Developmental							
Tubercular							
Parasitic							
Of the nervous system		2	2				
eye							
ear							
teeth							
circulatory system							
respiratory system		1			1		
digestive system		9	9				
urinary and genital system		2	1		1		
locomotive system			1				
integumentary system							
Non-malignant tumors and cysts		7	6			†1	
Wounds, injuries and accidents							
Total		32	28		2	2	

* Febris remit.

† Submersio.

Catskill, 4th rate. Iron-clad; screw; 496 tons.

[Employed during the year on the North Atlantic Station. Average number of ship's company, 18; total number of sick-days, 147; deaths, 1.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic		3	3				
Enthetic		3	1		1		1
Dietic		1					
Diathetic						*1	
Developmental							
Tubercular							
Parasitic							
Of the nervous system		1	1				
eye							
ear							
teeth							
circulatory system							
respiratory system		1					1
digestive system		1			1		
urinary and genital system							
locomotive system							
integumentary system							
Non-malignant tumors and cysts							
Wounds, injuries, and accidents		3	2		1		
Total		13	7		3	1	2

* Rheumatismus acutus.

Lehigh, 4th rate. Iron-clad; screw; 496 tons.

[Employed during the year on the North Atlantic Station. Average number of ship's company 18; total number of sick-days, 89; deaths, 0.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic							
Enthetic							
Dietic							
Diathetic							
Developmental							
Tubercular							
Parasitic							
Of the nervous system							
eye							
ear							
teeth							
circulatory system							
respiratory system							
digestive system							
urinary and genital system							
locomotive system							
integumentary system		3	3				
Non-malignant tumors and cysts							
Wounds, injuries, and accidents		2	2				
Total		5	5				

Mahopac, 4th rate. Iron clad; screw; 550 tons.

[Employed during the year on the North Atlantic Station. Average number of ship's company, 18; total sick-days, 206; deaths, 1.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic		5	5				
Enthetic		5	5				
Dietic							
Diathetic							
Developmental							
Tubercular							
Parasitic							
Of the nervous system		1			1		
eye							
ear							
teeth							
circulatory system							
respiratory system							
digestive system		1	1				
urinary and genital system		1	1				
locomotive system		1	1				
integumentary system							
Non-malignant tumors and cysts							
Wounds, injuries, and accidents		5	8	1		*1	
Total		18	15	1	1	1	

* Drowned.

Canonius, 4th rate. Iron-clad; screw; 550 tons.

[Employed during the year on the North Atlantic Station, at New Orleans, La. Average number of ship's company, 61; total sick-days, 790; deaths, 9. Ratio per thousand of cases treated to effectives, 1,295-].

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic.....		35	27		1	*7	
Enthetic.....		3	3				
Dietic.....		8	3				
Diathetic.....		14	13		1		
Developmental.....							
Tubercular.....							
Parasitic.....							
Of the nervous system.....		2	2				
eye.....		1	1				
ear.....							
teeth.....							
circulatory system.....							
respiratory system.....		5	3		1	†1	
digestive system.....		9	9				
urinary and genital system.....							
locomotive system.....							
integumentary system.....		3	3				
Non-malignant tumors and cysts.....							
Wounds, injuries, and accidents.....		4	3			1	
Total.....		79	67		3	9	

* Febris flava.

† Pneumonia.

‡ Drowned.

Manhattan, 4th rate. Iron-clad; screw; 550 tons.

[Employed second, third, and fourth quarters, 1878, on the North Atlantic Station. Average number of ship's company, 17; total sick-days, 109. Deaths, 1.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic.....		6	4		2		
Enthetic.....		3	2		1		
Dietic.....							
Diathetic.....		3	1		1		1
Developmental.....							
Tubercular.....							
Parasitic.....							
Of the nervous system.....							
eye.....							
ear.....							
teeth.....							
circulatory system.....							
respiratory system.....		1	1				
digestive system.....		1	1				
urinary and genital system.....							
locomotive system.....							
integumentary system.....							
Non-malignant tumors and cysts.....							
Wounds, injuries, and accidents.....		1				*1	
Total.....		15	9		4	1	1

* Drowned.

Wyandotte, 4th rate. Iron-clad; screw; 550 tons.

[Employed during the first and second quarters on the North Atlantic Station. Average number of ship's company, 25; total sick-days, 30; deaths, 0.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic		2		1	1		
Enthetic							
Dietic							
Diathetic							
Developmental							
Tubercular							
Parasitic							
Of the nervous system							
eye							
ear							
teeth							
circulatory system							
respiratory system		1	1				
digestive system		1	1				
urinary and genital system							
locomotive system							
integumentary system							
Non-malignant tumors and cysts							
Wounds, injuries, and accidents							
Total		4	2	1	1		

Montauk, 4th rate. Iron-clad; screw; 496 tons.

[Employed during second and fourth quarters, 1878, on North Atlantic Station. Average number of ship's company 22; total number of sick-days, 47; deaths, 0.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic		2	1		1		
Enthetic							
Dietic							
Diathetic							
Developmental							
Tubercular							
Parasitic							
Of the nervous system		1	1				
eye		1	1				
ear							
teeth							
circulatory system							
respiratory system		1	1				
digestive system		1	1				
urinary and genital system		1					
locomotive system							
integumentary system							
Non-malignant tumors and cysts							
Wounds, injuries, and accidents							
Total		6	5		1		

First quarter, 1878. North Atlantic Station.

[Aggregate: Total number of ships' company, 1,473; total number of sick-days, 2,497; deaths, 1.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic	4	35	32		4		3
Enthetic	2	33	19		10		6
Dietic		4	4				
Diathetic	1	20	15		5		1
Developmental							
Tubercular							
Parasitic	1						1
Of the nervous system	1	10	8		1		1
eye	1	5	3		1		2
ear							
teeth							
circulatory system		1	1				
respiratory system		18	13		2		3
digestive system		35	32				3
urinary and genital system		7	6				1
locomotive system		2			1		1
integumentary system		19	16		2		1
Non-malignant tumors and cysts							
Total diseases	9	189	149		26		23
Wounds, injuries, and accidents	2	56	51			1	4
Total	11	245	200		26	1	27

* Drowned.

Second quarter 1878. North Atlantic Station.

[Aggregate: Total number of ships' companies, 1,468; total number of sick-days, 2,916; deaths, 1.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic	3	36	36		3		
Enthetic	6	24	27		2		1
Dietic		5	4		1		
Diathetic	1	18	13		2	1	3
Developmental							
Tubercular							
Parasitic	1		1				
Of the nervous system	1	10	6		5		
eye	2	4	3		2		1
ear							
teeth							
circulatory system		1			1		
respiratory system	3	15	13		4		1
digestive system	3	46	46				3
urinary and genital system	1	5	3	1	2		
locomotive system	1		1				
integumentary system	1	15	12		2		2
Non-malignant tumors and cysts							
Total diseases	23	179	165	1	24	1	11
Wounds, injuries, and accidents	4	31	26		5		4
Total	27	210	191	1	29	1	15

* Rheumatismus acutus.

Third quarter 1878. North Atlantic Station.

[Aggregate: Total number of ships' companies, 1,155; total number of sick-days, 1,830; deaths, 9.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic.....		63	46		2	*7	8
Enthetic.....	1	38	27		7		5
Dietic.....		7	7				
Diathetic.....	3	15	12		6		
Developmental.....							
Tubercular.....							
Parasitic.....							
Of the nervous system.....		7	3		3		1
eye.....	1	5	5		1		
ear.....		1	1				
teeth.....							
circulatory system.....							
respiratory system.....	1	11	8	1	2		1
digestive system.....	3	35	29		8		1
urinary and genital system.....		4	3				1
locomotive system.....							
integumentary system.....	2	12	12		2		
Non-malignant tumors and cysts.....							
Total diseases.....	11	198	153	1	81	7	17
Wounds, injuries, and accidents.....	4	34	27		5	†2	4
Total.....	15	232	180	1	86	9	21

* Febris flava.

† Drowned.

Fourth quarter 1878. North Atlantic Station.

[Aggregate: Total number of ships' companies, 1,927; total number of sick-days, 2,345; deaths, 6.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic.....	8	50	42		9	*4	3
Enthetic.....	5	23	14	1	7		6
Dietic.....		13	11				2
Diathetic.....		15	8		6		1
Developmental.....							
Tubercular.....		1	1				
Parasitic.....							
Of the nervous system.....	1	18	12		7		
eye.....		8	7		1		
ear.....							
teeth.....							
circulatory system.....		2			2		
respiratory system.....	1	53	31		8	†1	14
digestive system.....	1	30	22		5		4
urinary and genital system.....	1	13	8		4		2
locomotive system.....		1	1				
integumentary system.....		33	24		1		8
Non-malignant tumors and cysts.....							
Total diseases.....	17	260	181	1	50	5	40
Wounds, injuries, and accidents.....	4	66	59	1	3	†1	6
Total.....	21	326	240	2	53	6	46

* 1 feb. remit, 3 feb. flava.

† Pneumonia.

; Drowned.

North Atlantic Station.

AGGREGATE, 1878.

[Average number of ships' companies, 1,505 +; total sick-days, 8,688; deaths, 17. Ratio per thousand of cases treated to effectives, 722 +. Ratio in 1877, 708 +.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic	4	184	156	.....	18	11	3
Enthetic	2	118	87	1	26	.....	6
Dietic .....	.....	20	26	.....	1	.....	2
Diathetic	1	68	48	.....	19	1	1
Developmental .....	.....	.....	.....	.....	.....	.....	.....
Tubercular .....	.....	.....	.....	.....	.....	.....	.....
Parasitic	1	1	2	.....	.....	.....	.....
Of the nervous system .....	.....	45	29	.....	16	.....	.....
eye	1	22	18	.....	5	.....	.....
ear .....	.....	1	1	.....	.....	.....	.....
teeth .....	.....	.....	.....	.....	.....	.....	.....
circulatory system .....	.....	4	1	.....	3	.....	.....
respiratory system .....	.....	97	65	1	16	1	14
digestive system .....	.....	146	129	.....	13	.....	4
urinary and genital system .....	.....	29	20	1	6	.....	2
locomotive system .....	.....	3	2	.....	1	.....	.....
integumentary system .....	.....	79	64	.....	7	.....	8
Non-malignant tumors and cysts .....	.....	.....	.....	.....	.....	.....	.....
Total diseases	9	828	648	3	131	13	40
Wounds, injuries, and accidents	2	187	163	1	15	4	6
Total	11	1,013	811	4	146	17	46

SOUTH ATLANTIC STATION.

The geographic limits of this station are the southeast coast of South America and part of the west coast of Africa.

During the year 1877, the following vessels were employed at different times upon this station, viz: Hartford (as flag-ship) and Essex.

The deaths were: from febris flava, 1; febris remittens, 2; diabetes, 1; volvulus, 1; tumor cerebri, 1; alcoholism, 1.

The usual tables are appended.

Hartford, flag-ship, 2d rate. Wood; screw; 2,000 tons.

[Employed during the year on the South Atlantic Station, as flag-ship. Average number of ship's company, 395; total sick-days, 4,299; deaths, 6. Ratio per thousand of cases treated to effectives, 731 +.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic	3	50	51			*2	
Enthetic	1	30	30		1		
Dietic		5	4			†1	
Diathetic	2	37	33		6		
Developmental							
Tubercular							
Parasitic							
Of the nervous system		12	10		2		
eye	†	5	6				
ear							
teeth		1	1				
circulatory system		1	1				
respiratory system	2	32	29		5		
digestive system		28	26		1	‡1	
urinary and genital system		8	5		2	*§1	
locomotive system		1	1				
integumentary system	1	32	30		2		1
Non-malignant tumors and cysts		2	1			||1	
Wounds, injuries, and accidents	3	52	51		2		2
Total	13	296	279		21	6	3

* Feb. remit.

† Alcoholism.

‡ Volvulus.

§ Diabetes.

|| Tumor cerebri.

Essex, 3d rate. Wood; screw; 615 tons.

[Employed during the year on the South Atlantic Station. Average number of ship's company, 186; total sick-days, 633; deaths, 1. Ratio per thousand of cases treated to effectives, 317 +.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic	1	13	11		2	*1	
Enthetic		2	2				
Dietic		1	1				
Diathetic	1	9	8		2		
Developmental							
Tubercular							
Parasitic							
Of the nervous system		1	1				
eye							
ear		3	2				1
teeth							
circulatory system		2	1				
respiratory system	1	4	4		2		
digestive system		10	8				2
urinary and genital system		2	2				
locomotive system		2	2				
integumentary system							
Non-malignant tumors and cysts		7	6		1		
Wounds, injuries, and accidents							
Total	3	56	48		7	1	3

* Febris flava.

First quarter, 1878. South Atlantic Station.

[Aggregate: Total number of ships' companies, 592; total number of sick-days, 1,324; deaths, 1.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic.....	4	7	9				3
Enthetic.....	1	8	6				3
Dietic.....		3	3				
Diathetic.....	3	12	8		1		6
Developmental.....							
Tubercular.....							
Parasitic.....							
Of the nervous system.....		12	2				
eye.....	1	2	3				
ear.....		1	1				
teeth.....							
circulatory system.....		1	1				
respiratory system.....	3	6	7				2
digestive system.....		8	6				3
urinary and genital system.....		4	2				2
locomotive system.....							
integumentary system.....	1	10	8				3
Non-malignant tumors and cysts.....		1				*1	
Total diseases.....	13	65	56		1	1	20
Wounds, injuries, and accidents.....	3	24	23				4
Total.....	16	89	79		1	1	24

* Tumor cerebri.

Second quarter, 1878. South Atlantic Station.

[Aggregate: Total number of ships' companies, 594; total number of sick-days, 1,637; deaths, 2.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic.....	2	7	8				1
Enthetic.....	3	11	10				4
Dietic.....							
Diathetic.....	6	13	15				4
Developmental.....							
Tubercular.....							
Parasitic.....							
Of the nervous system.....		5	3				2
eye.....		2	2				
ear.....							
teeth.....							
circulatory system.....							
respiratory system.....	2	15	13		1		3
digestive system.....	2	14	13			*1	2
urinary and genital system.....	2	5	6			†1	
locomotive system.....							
integumentary system.....	3	10	11				2
Non-malignant tumors and cysts.....		1	1				
Total diseases.....	20	83	82		1	2	18
Wounds, injuries, and accidents.....	4	10	12				2
Total.....	24	93	94		1	2	20

* Vulvula.

† Diabetes.

Third quarter, 1878. South Atlantic Station.

[Aggregate: Total number of ships' companies, 578; total number of sick-days, 1,297; deaths, 3.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic.....	1	47	42		2	*2	2
Enthetic.....	4	11	13		1		1
Dietic.....		3	1			1	1
Diathetic.....	4	13	10		7		
Developmental.....							
Tubercular.....							
Parasitic.....							
Of the nervous system.....	2	3	2		2		1
eye.....		1	1				
ear.....							
teeth.....							
circulatory system.....							
respiratory system.....	3	12	9				1
digestive system.....	3	4	5		1		
urinary and genital system.....		4	2		2		
locomotive system.....		1					1
integumentary system.....	2	9	9		2		
Non-malignant tumors and cysts.....							
Total diseases.....	18	108	94		22	3	7
Wounds, injuries, and accidents.....	2	11	8		3		2
Total.....	20	119	102		25	3	9

* 1 febris flava; 1 febris remit.

† Alcoholism.

Fourth quarter, 1878. South Atlantic Station.

[Aggregate: Total number of ships' companies, 563; total number of sick-days, 674; deaths, 1.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic.....	2	2	3			*1	
Enthetic.....	1	2	3				
Dietic.....	1		1				
Diathetic.....		8	8				
Developmental.....							
Tubercular.....							
Parasitic.....							
Of the nervous system.....	1	3	4				
eye.....							
ear.....		2	1				1
teeth.....							
circulatory system.....		1	2				
respiratory system.....	1	1	2				
digestive system.....		6	6				
urinary and genital system.....		5	3				2
locomotive system.....	1	2	3				
integumentary system.....		6	5				1
Non-malignant tumors and cysts.....							
Total diseases.....	7	37	39			1	4
Wounds, injuries, and accidents.....	2	14	14				2
Total.....	9	51	53			1	6

* Feb. remit.

South Atlantic Station.

AGGREGATE.

[Average number of ships' companies, 562; total sick-days, 4,932; ratio per thousand of cases treated to effectives, 719+; deaths, 7; ratio in 1877, 697+.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic.....	4	63	62	.....	2	3	.....
Enthetic.....	1	32	32	.....	1	.....	.....
Dietic.....	.....	6	5	.....	.....	1	.....
Diathetic.....	3	46	41	.....	8	.....	.....
Developmental.....	.....	.....	.....	.....	.....	.....	.....
Tubercular.....	.....	.....	.....	.....	.....	.....	.....
Parasitic.....	.....	.....	.....	.....	.....	.....	.....
Of the nervous system.....	.....	13	11	.....	2	.....	.....
eye.....	1	5	6	.....	.....	.....	.....
ear.....	.....	3	2	.....	.....	.....	1
teeth.....	.....	.....	.....	.....	.....	.....	.....
circulatory system.....	.....	1	1	.....	.....	.....	.....
respiratory system.....	3	24	31	.....	6	.....	.....
digestive system.....	.....	32	30	.....	1	1	.....
urinary and genital system.....	.....	18	13	.....	2	1	2
locomotive system.....	.....	3	3	.....	.....	.....	.....
integumentary system.....	1	35	33	.....	2	.....	1
Non-malignant tumors and cysts.....	.....	2	1	.....	.....	1	.....
Total diseases.....	13	293	271	.....	24	7	4
Wounds, injuries, and accidents.....	3	59	57	.....	3	.....	2
Total.....	16	352	328	.....	27	7	6

EUROPEAN STATION.

The geographic limits of this station are all the coasts of Europe, the Mediterranean, and part of the west coast of Africa.

The following vessels were employed on this station: Trenton (flag-ship), Vandalia, Marion, Alliance, and Dispatch.

The usual tables are appended.

The deaths were: from phthisis pneumon. chron., 1; pneumonia chron., 1; adynamia and dropsy, 1; febris enterica, 1.

Dispatch, 4th rate. Wood; screw; 730 tons.

[Employed during the year on the European Station. Average number of ship's company, 51; total sick-days, 527; deaths, 1; ratio per thousand of cases treated to effectives, 725 +.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic.....		5	3		2		
Enthetic.....		6	6				
Dietic.....							
Diathetic.....		7	6		1		
Developmental.....							
Tubercular.....		1	1				
Parasitic.....		1	1				
Of the nervous system.....		1	1				
eye.....							
ear.....							
teeth.....							
circulatory system.....							
respiratory system.....		4	2		1	1*	
digestive system.....		7	6		1		
urinary and genital system.....		1	1				
locomotive system.....							
integumentary system.....		1	1				
Non-malignant tumors and cysts.....							
Wounds, injuries, and accidents.....		4	4				
Total.....		37	31		5	1	

* Pneumonia chron.

Vandalia, 3d rate. Screw; 981 tons.

[Employed during the year on the European Station. Average number of ship's company, 185; total sick-days, 2,890; deaths, 3; ratio per thousand of cases treated to effectives, 1,605 +.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic.....		32	30		1	1*	
Enthetic.....		13	12				1
Dietic.....		3	3				
Diathetic.....		26	18		2	1†	5
Developmental.....							
Tubercular.....							
Parasitic.....		3	3				
Of the nervous system.....		17	14		1		2
eye.....		6	5		1		
ear.....		1	1				
teeth.....							
circulatory system.....		1			1		
respiratory system.....	1	44	41	1	1	1	1
digestive system.....		33	32				1
urinary and genital system.....		12	11		1		
locomotive system.....		1	1				
integumentary system.....	1	44	44				1
Non-malignant tumors and cysts.....		1	1				
Wounds, injuries, and accidents.....		39	39				
Total.....	2	276	255	1	8	3	11

* Feb. enterica.

† Adynamia and dropsy.

; Phthisis pneum. chron.

Alliance, 3d rate. - Screw; 615 tons.

[Employed during the year on the European Station. Average number of ship's company, 160; total sick-days, 1,683; deaths, 0; ratio per thousand of cases treated to effectives, 764 +.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic		22	22				
Enthetic	1	17	15	1	1		1
Dietic		5	4				1
Diathetic		16	13		8		
Developmental							
Tubercular							
Parasitic							
Of the nervous system	1	23	19	2	3		
eye		7	4		3		
ear							
teeth							
circulatory system		2	2				
respiratory system		23	20		3		
digestive system	1	36	30		6		1
urinary and genital system		7	5	1	1		
locomotive system		2	1		1		
integumentary system		21	21		1		
Non-malignant tumors and cysts							
Wounds, injuries, and accidents		28	23	1	8		1
Total	3	209	179	5	24		4

Trenton, flag-ship, 2d rate. Food; screw; 2,300 tons.

[Employed during the year on the European Station. Average number of ship's company, 438; total sick-days, 3,295; deaths, 0; ratio per thousand of cases treated to effectives, 664 +.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic		16	16				
Enthetic	3	39	34	2	1		5
Dietic		8	8				
Diathetic		34	26		7		1
Developmental		1			1		
Tubercular							
Parasitic							
Of the nervous system		16	11	1	4		
eye		6	4		2		
ear		1	1				
teeth							
circulatory system		3			3		
respiratory system		26	19		6		1
digestive system		46	45				1
urinary and genital system	1	13	12	1	1		
locomotive system		1	1				
integumentary system	1	18	19				
Non-malignant tumors and cysts		2	2				
Wounds, injuries, and accidents	2	67	68		1		
Total	7	297	266	4	26		8

Marion, 3d rate. Wood; screw; 910 tons.

[Employed during the year on the European Station. Average number of ship's company, 201; total sick-days, 2,438; deaths, 0; ratio per thousand of cases treated to effectives, 860+.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining
Miasmatic.....		17	17				
Enthetic.....	3	14	16				
Dietic.....	1	8	8		1		
Diathetic.....		6	5		1		
Developmental.....		1	1				
Tubercular.....							
Parasitic.....							
Of the nervous system.....		13	7		1		5
eye.....		3	3				
ear.....		2	2				
teeth.....							
circulatory system.....		3	1		2		
respiratory system.....	2	40	40				2
digestive system.....		14	14				
urinary and genital system.....		7	7				
locomotive system.....							
integumentary system.....	1	20	20				1
Non-malignant tumors and cysts.....							
Wounds, injuries, and accidents.....	1	18	18				1
Total.....	7	166	159		5		9

First quarter, 1878. European Station.

[Aggregate: Total number of ships' companies, 1,066; total number of sick-days, 3,053; deaths, 0.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic.....		21	18		2		1
Enthetic.....	6	17	18				5
Dietic.....	1	6	7				
Diathetic.....		16	12				4
Developmental.....							
Tubercular.....							
Parasitic.....							
Of the nervous system.....	1	21	19				3
eye.....		7	6				1
ear.....							
teeth.....							
circulatory system.....		3	2				1
respiratory system.....	3	84	77		1		9
digestive system.....	1	39	36				4
urinary and genital system.....	1	14	11	1			3
locomotive system.....		1	1				
integumentary system.....	3	32	31				4
Non-malignant tumors and cysts.....		3	3				
Total diseases.....	16	264	241	1	3		35
Wounds, injuries, and accidents.....	3	33	33				3
Total.....	19	297	274	1	3		38

Second quarter, 1878. European Station.

[Aggregate: Total number of ships' companies, 1,005; total number of sick-days, 2,896; deaths, 1.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic.....	1	31	31				1
Enthetic.....	5	23	23	1			4
Dietic.....		5	3		1		1
Diathetic.....	4	20	13		7		4
Developmental.....							
Tubercular.....							
Parasitic.....							
Of the nervous system.....	3	9	7		5		
eye.....	1	7	3		4		1
ear.....		2	2				
teeth.....		5					
circulatory system.....	1	5			4		3
respiratory system.....	9	15	16		5	1	
digestive system.....	4	32	28		3		5
urinary and genital system.....	3	12	13		1		1
locomotive system.....		1			1		
integumentary system.....	4	19	23				
Non-malignant tumors and cysts.....							
Total diseases.....	35	181	162	1	31	1	21
Wounds, injuries, and accidents.....	3	30	36		1		5
Total.....	38	220	198	1	32	1	26

* Phthisis pneumonia, chronic.

Third quarter, 1878. European Station.

[Aggregate: Total number of ships' companies, 1,025; total number of sick-days, 2,385; deaths, 2.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic.....	1	18	17				2
Enthetic.....	4	23	20		1		6
Dietic.....	1	8	9				
Diathetic.....	4	26	23		4	1	3
Developmental.....							
Tubercular.....							
Parasitic.....		3	3				
Of the nervous system.....		21	14	2			4
eye.....	1	2	1		2		
ear.....		1	1				
teeth.....							
circulatory system.....	2	1	1		2		
respiratory system.....	2	19	14	1	3	1	2
digestive system.....	5	38	39		4		
urinary and genital system.....	1	9	7	1	2		
locomotive system.....		1	1				
integumentary system.....		32	30				
Non-malignant tumors and cysts.....							
Total diseases.....	21	202	180	4	19	2	18
Wounds, injuries, and accidents.....	5	46	39	1	3		6
Total.....	26	248	219	5	22	2	26

* Adynamia and dropsy.

† Pneumonia, chronic.

Fourth quarter, 1878. European Station.

[Aggregate: Total number of ships' companies, 1,054; total number of sick-days, 2,708; deaths, 1.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic.....	2	23	23	.....	1	*1	.....
Enthetic.....	6	23	19	2	1	.....	7
Dietic.....	.....	5	4	.....	.....	.....	1
Diathetic.....	2	27	20	3	.....	.....	6
Developmental.....	.....	2	1	.....	1	.....	.....
Tubercular.....	.....	.....	.....	.....	.....	.....	.....
Parasitic.....	.....	1	1	.....	.....	.....	.....
Of the nervous system.....	4	19	12	1	3	.....	7
eye.....	.....	6	6	.....	.....	.....	.....
ear.....	.....	1	1	.....	.....	.....	.....
teeth.....	.....	.....	.....	.....	.....	.....	.....
circulatory system.....	.....	.....	.....	.....	.....	.....	.....
respiratory system.....	2	22	17	.....	3	.....	4
digestive system.....	.....	27	24	.....	.....	.....	3
urinary and genital system.....	.....	8	8	.....	.....	.....	.....
locomotive system.....	.....	1	1	.....	.....	.....	.....
integumentary system.....	2	21	21	.....	.....	.....	2
Non-malignant tumors and cysts.....	.....	.....	.....	.....	.....	.....	.....
Total diseases.....	18	186	158	6	9	1	30
Wounds, injuries, and accidents.....	8	38	44	.....	.....	.....	2
Total.....	26	224	202	6	9	1	32

* Febris enterica.

European Station.

AGGREGATE.

[Average number of ships' companies, 1,037; total sick-days, 11,042; deaths, 4. Ratio per thousand of cases treated to effectives, 972+. Ratio in 1877, 984+.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic.....	.....	93	89	.....	3	1	.....
Enthetic.....	6	86	80	3	2	.....	7
Dietic.....	1	24	23	1	1	.....	1
Diathetic.....	.....	89	68	3	11	1	6
Developmental.....	.....	2	1	.....	1	.....	.....
Tubercular.....	.....	.....	.....	.....	.....	.....	.....
Parasitic.....	.....	4	4	.....	.....	.....	.....
Of the nervous system.....	1	70	52	3	9	.....	7
eye.....	.....	22	16	.....	6	.....	.....
ear.....	.....	4	4	.....	.....	.....	.....
teeth.....	.....	.....	.....	.....	.....	.....	.....
circulatory system.....	.....	9	3	.....	6	.....	.....
respiratory system.....	3	140	124	1	12	2	4
digestive system.....	1	136	127	.....	7	.....	3
urinary and genital system.....	1	43	39	2	3	.....	.....
locomotive system.....	.....	4	3	.....	1	.....	.....
integumentary system.....	3	104	105	.....	.....	.....	2
Non-malignant tumors and cysts.....	.....	3	3	.....	.....	.....	.....
Total diseases.....	16	833	741	12	62	4	30
Wounds, injuries, and accidents.....	3	156	152	1	4	.....	2
Total.....	19	989	893	13	66	4	32

NORTH PACIFIC STATION.

The geographic limits of this station are north of the equator, except so much of the west coast of South America and of the Isthmus as lies between the equator and Panama and the Sandwich Islands.

The following vessels were employed on this station: Pensacola (flag-ship), Lackawanna, and Tuscarora.

The usual tables are appended and explain themselves.

The deaths were: from accidental poisoning, 1; fracture cranium, 1.

Pensacola, flag-ship, 2d rate. Wood; screw; 2,000 tons.

[Employed on North Pacific Station. Average number of ship's company, 341; total number of sick-days, 1,887; deaths, 1. Ratio per thousand of cases treated to effectives, 633+.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic.....	1	14	15				
Enthetic.....		8	7				1
Dietic.....		7	7				
Diathetic.....		9	9				
Developmental.....	1				1		
Tubercular.....							
Parasitic.....							
Of the nervous system.....	1	11	11				1
eye.....	1	4	3		2		
ear.....		3	1				
teeth.....							
circulatory system.....		2	2				
respiratory system.....		17	15	1			1
digestive system.....		38	38				
urinary and genital system.....	1	3	3				1
locomotive system.....		3	2				1
integumentary system.....		28	28				1
Non-malignant tumors and cysts.....							
Wounds, injuries, and accidents.....	3	60	58		3	*1	1
Total.....	8	208	199	1	8	1	7

* Fracture cranium.

Tuscarora, 3d rate. Wood; screw; 726 tons.

[Employed on North Pacific Station, on coast of Mexico. Average number of ship's company, 181; total number of sick-days, 3,107; deaths, 1. Ratio per thousand of cases treated to effectives, 2,188+.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic.....		110	105		5		
Enthetic.....		25	22	2	1		
Dietic.....		7	7				
Diathetic.....		23	20		3		
Developmental.....							
Tubercular.....							
Parasitic.....							
Of the nervous system.....		22	21		1		
eye.....							
ear.....		4	4				
teeth.....							
circulatory system.....		9	8				1
respiratory system.....		29	24		4		1
digestive system.....		33	32		1		
urinary and genital system.....		9	7		2		
locomotive system.....		1	1				1
integumentary system.....		54	52		1		1
Non-malignant tumors and cysts.....							
Wounds, injuries and accidents.....		70	66		1	*1	2
Total.....		396	369	2	19	1	5

* Accidental poisoning.

Lackawanna, 2d rate. Wood; screw; 1,026 tons.

[Employed first and fourth quarters on North Pacific Station. Average number of ship's company, 170; total number of sick-days, 323; deaths, 0. Ratio per thousand of cases treated to effectives, 288 +.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic		11	11				
Enthetic		4	1		2		1
Dietic							
Diathetic		5	4				1
Developmental							
Tubercular							
Parasitic							
Of the nervous system							
eye		2					2
ear							
teeth							
circulatory system		2	1		1		
respiratory system		2	1				1
digestive system		5	4		1		
urinary and genital system		1			1		
locomotive system		1			1		
integumentary system		2	1				1
Non-malignant tumors and cysts							
Wounds, injuries, and accidents		14	13				1
Total		49	36		6		7

First quarter, 1972. North Pacific Station.

[Aggregate: Total number of ships' companies, 690; total number of sick-days, 858; deaths, 0.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic	1	10	11				
Enthetic		8	4		2		2
Dietic		5	5				
Diathetic		2	2				
Developmental	1				1		
Tubercular							
Parasitic							
Of the nervous system	1	5	6				
eye	1	1	2				
ear		4	4				
teeth							
circulatory system		2	2				
respiratory system		6	5				1
digestive system		17	17				
urinary and genital system	1	3	3		1		
locomotive system							
integumentary system		7	7				
Non-malignant tumors and cysts							
Total diseases	5	70	68		4		3
Wounds, injuries and accidents	3	43	40		1		5
Total	8	113	108		5		8

Second quarter, 1878. North Pacific Station.

[Aggregate: Total number of ships' companies, 459; total sick-days, 1,224; deaths, 1.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic.....		7	7				
Enthetic.....	2	11	9	1	1		2
Dietic.....		4	4				
Diathetic.....	2	7	5		1		1
Developmental.....							
Tubercular.....							
Parasitic.....							
Of the nervous system.....		14	14				
eye.....		2	1		1		
ear.....		2					
teeth.....							
circulatory system.....		2	2				
respiratory system.....	1	11	10	1	1		
digestive system.....		19	18				1
urinary and genital system.....		5	3				2
locomotive system.....	*						2
integumentary system.....		33	31				2
Non-malignant tumors and cysts.....							
Total diseases.....	3	117	104	2	6		*
Wounds, injuries and accidents.....	5	38	39		3	*1	
Total.....	8	155	143	2	9	1	8

* Fracture cranium.

Third quarter, 1878. North Pacific Station.

[Aggregate: Total number of ships' companies, 175; total sick-days, 1,783; deaths, 0.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic.....		70	43		5		15
Enthetic.....	2	11	11	1			1
Dietic.....		3	3				
Diathetic.....	1	16	16		1		
Developmental.....							
Tubercular.....							
Parasitic.....							
Of the nervous system.....		8	6		1		1
eye.....							
ear.....		1					1
teeth.....							
circulatory system.....		4	4				
respiratory system.....		1	1				
digestive system.....	1	18	18		1		
urinary and genital system.....	2	2	4				
locomotive system.....							
integumentary system.....	2	27	29				
Non-malignant tumors and cysts.....							
Total diseases.....	8	161	135	1	8		8
Wounds, injuries, and accidents.....		19	18			*1	
Total.....	8	180	153	1	8	1	8

* Accidental poisoning.

Fourth quarter, 1878. North Pacific Station.

[Aggregate: Total number of ships' companies, 767; total sick-days, 1,452; deaths, 0.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic	32	48	70				
Enthetic	1	7	6				2
Dietic		2	2				
Diathetic		12	10		1		1
Developmental							
Tubercular							
Parasitic							
Of the nervous system	1	6	6				1
eye		3			1		2
ear	1		1				
teeth		5	3				1
circulatory system					1		
respiratory system		20	24		3		3
digestive system		22	21		1		
urinary and genital system		3			2		1
locomotive system		5	3		1		1
integumentary system		18	14		1		3
Non-malignant tumors and cysts							
Total diseases	25	161	160		11		15
Wounds, injuries, and accidents		44	40				4
Total	25	205	200		11		19

North Pacific Station.

AGGREGATE, 1878.

[Average number of ships' companies, 523; total sick-days, 5,317; deaths, 2; ratio per thousand of cases treated to effectives, 1,263+; ratio in 1877, 839+.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic	1	135	131		5		
Enthetic		37	30	2	3		2
Dietic		14	14				
Diathetic		37	33		3		1
Developmental	1				1		
Tubercular							
Parasitic							
Of the nervous system	1	33	32		1		1
eye	1	6	3		2		2
ear		7	5		2		
teeth							
circulatory system		13	11		1		1
respiratory system		48	40	1	4		3
digestive system		76	74		2		
urinary and genital system	1	13	10		3		1
locomotive system		5	3		1		1
integumentary system		85	81		1		3
Non-malignant tumors and cysts							
Total diseases	5	509	467	3	29		15
Wounds, injuries, and accidents	3	144	137		4	2	4
Total	8	653	604	3	33	2	19

SOUTH PACIFIC STATION.

The geographic limits of this station are the west coast of the Isthmus and South America, lying between Panama and the equator, the west coast of South America, the islands and waters of the Pacific south of the equator as far west as the one hundred and fiftieth parallel, including the coast and sea-ports of Australia.

The vessels employed on this station were the Omaha, Onward, Alaska, and Adams. The Onward was at Callao, Peru, and the Omaha was, during the first and second quarters, *en route* from the South Pacific to the navy-yard at Portsmouth, N. H. The other vessels were cruising on the station.

The ratio of cases treated, per thousand, to effectives on this station for the year is small, *i. e.*, 529, a trifle over one-fourth the ratio of 1877.

Adams, 3d rate. Screw; wood; 615 tons.

[Employed first, second, and fourth quarters on South Pacific Station. Average number of ship's company, 213; total sick-days, 1,416; deaths, 1; ratio per thousand of cases treated to effectives, 2,366+.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic.....		11	10		1		
Enthetic.....	2	9	9				2
Dietic.....	1	1	2				
Diathetic.....		7	4	1			2
Developmental.....							
Tubercular.....							
Parasitic.....							
Of the nervous system.....		3	3				
eye.....							
ear.....		1					1
teeth.....							
circulatory system.....							
respiratory system.....	1	9	8		1		1
digestive system.....		9	8		1		
urinary and genital system.....	1	4	5				
locomotive system.....							
integumentary system.....	1	13	13		1		
Non-malignant tumors and cysts.....							
Wounds, injuries, and accidents.....		17	14		1	1*	1
Total.....	6	84	76	1	5	1	7

* Vulnus laceratum of knee and tetanus.

Alaska, 2d rate. Wood; screw; 1,122 tons.

Employed second, third, and fourth quarters on South Pacific Station. Average number of ship's company, 298; total number of sick-days, 1,224; deaths, 1; ratio per thousand of cases treated to effectives, 385+.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic.....		4	2			1*	1
Enthetic.....		5	4		1		
Dietic.....		5	1				1
Diathetic.....		5	5				
Developmental.....							
Tubercular.....							
Parasitic.....							
Of the nervous system.....		6	5				1
eye.....		1	1				
ear.....							
teeth.....							
circulatory system.....							
respiratory system.....		8	5		2		1
digestive system.....		26	24		1		1
urinary and genital system.....		4	3		1		
locomotive system.....		5	4		1		
integumentary system.....		13	13				
Non-malignant tumors and cysts.....							
Wounds, injuries, and accidents.....		35	33		1		1
Total.....		114	100		7	1	6

* Feb. remittens.

Onward, 4th rate. Sails; wood; 804 tons.

Employed on the South Pacific Station, at Callao, Peru. Average number of ship's company, 43; total number of sick-days, 156; deaths, 0. Ratio per thousand of cases treated to effectives, 581+.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic.....		7	7				
Enthetic.....		1	1				
Dietic.....							
Diathetic.....		1	1				
Developmental.....							
Tubercular.....							
Parasitic.....							
Of the nervous system.....		2	2				
eye.....							
ear.....							
teeth.....							
circulatory system.....							
respiratory system.....		4	3		1		
digestive system.....		3	3				
urinary and genital system.....		1	1				
locomotive system.....							
integumentary system.....		1	1				
Non-malignant tumors and cysts.....							
Wounds, injuries, and accidents.....		5	5				
Total.....		25	24		1		

Omaha, 2d rate. Wood ; screw ; 1,122 tons.

[Part of first and second quarters *en route* home from South Pacific Station, and at navy-yard, Portsmouth, N. H. Average number of ship's company, 260; total sick-days, 1,379; deaths, 0. Ratio per thousand of cases treated to effectives, 615 +.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic.....	1	26	27				
Enthetic.....	1	1	2				
Dietic.....							
Diathetic.....	1	20	20		1		
Developmental.....							
Tubercular.....							
Parasitic.....							
Of the nervous system.....	1	10	10				1
eye.....							
ear.....		1	1				
teeth.....		1	1				
circulatory system.....							
respiratory system.....		20	20				
digestive system.....	1	20	21				
urinary and genital system.....		5	5				
locomotive system.....							
integumentary system.....	1	13	14				
Non-malignant tumors and cysts.....							
Wounds, injuries, and accidents.....	4	33	26		1		
Total.....	10	150	157		2		1

First quarter, 1878. South Pacific Station.

[Aggregate: Total number of ships' companies, 520; total number of sick-days, 1,594; deaths, 0.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic.....	1	26	26				1
Enthetic.....	3	5	7				1
Dietic.....	1		1				
Diathetic.....	1	15	13	1			2
Developmental.....							
Tubercular.....							
Parasitic.....							
Of the nervous system.....	1	10	10				1
eye.....							
ear.....		1	1				
teeth.....		1	1				
circulatory system.....							
respiratory system.....	1	12	12				1
digestive system.....	1	17	17				1
urinary and genital system.....	1	8	8				1
locomotive system.....							
integumentary system.....	2	19	16				5
Non-malignant tumors and cysts.....							
Total diseases.....	12	114	112	1			13
Wounds, injuries, and accidents.....	4	24	26				2
Total.....	16	138	138	1			15

Second quarter, 1878. South Pacific Station.

[Aggregate: Total number of ships' companies, 806; total number of sick-days, 1,100; deaths, 0.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic	1	15	15	.....	1	.....	.....
Enthetic	1	2	1	.....	1	.....	1
Dietic .....	.....	1	1	.....	.....	.....	.....
Diathetic	2	13	14	.....	1	.....	.....
Developmental .....	.....	.....	.....	.....	.....	.....	.....
Tubercular .....	.....	.....	.....	.....	.....	.....	.....
Parasitic .....	.....	.....	.....	.....	.....	.....	.....
Of the nervous system	1	5	4	.....	1	.....	1
eye .....	.....	.....	.....	.....	.....	.....	.....
ear .....	.....	.....	.....	.....	.....	.....	.....
teeth .....	.....	.....	.....	.....	.....	.....	.....
circulatory system .....	.....	.....	.....	.....	.....	.....	.....
respiratory system	1	10	11	.....	.....	.....	.....
digestive system	1	12	11	.....	2	.....	.....
urinary and genital system	1	2	2	.....	.....	.....	1
locomotive system .....	.....	1	.....	.....	1	.....	.....
integumentary system	5	8	11	.....	1	.....	1
Non-malignant tumors and cysts .....	.....	.....	.....	.....	.....	.....	.....
Total diseases	13	69	70	.....	8	.....	4
Wounds, injuries, and accidents	2	31	27	.....	3	.....	8
Total	15	100	97	.....	11	.....	7

Third quarter, 1878. South Pacific Station.

[Aggregate: Total number of ships' companies, 333; total sick-days, 679; deaths, 1.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic .....	.....	4	3	.....	.....	*1	.....
Enthetic	1	.....	1	.....	.....	.....	.....
Dietic .....	.....	1	1	.....	.....	.....	.....
Diathetic .....	.....	.....	.....	.....	.....	.....	.....
Developmental .....	.....	.....	.....	.....	.....	.....	.....
Tubercular .....	.....	.....	.....	.....	.....	.....	.....
Parasitic .....	.....	.....	.....	.....	.....	.....	.....
Of the nervous system	1	1	1	.....	.....	.....	1
eye .....	.....	.....	.....	.....	.....	.....	.....
ear .....	.....	.....	.....	.....	.....	.....	.....
teeth .....	.....	.....	.....	.....	.....	.....	.....
circulatory system .....	.....	4	3	.....	.....	.....	.....
respiratory system .....	.....	7	7	.....	.....	.....	1
digestive system .....	.....	3	3	.....	.....	.....	.....
urinary and genital system	1	3	3	.....	1	.....	.....
locomotive system .....	.....	1	1	.....	.....	.....	.....
integumentary system	1	5	6	.....	.....	.....	.....
Non-malignant tumors and cysts .....	.....	.....	.....	.....	.....	.....	.....
Total diseases	4	26	26	.....	1	1	3
Wounds, injuries, and accidents	3	13	14	.....	.....	.....	3
Total	7	39	40	.....	1	1	4

* Feb. remit.

Fourth quarter 1878. South Pacific Station.

[Aggregate: Total number of ships' companies, 561; total sick-days, 1,102; deaths, 1.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic		4	3				1
Enthetic		9	7				2
Dietic		2	1				1
Diathetic		4	2				2
Developmental							
Tubercular							
Parasitic							
Of the nervous system	1	5	5				1
eye		1	1				
ear		1					1
teeth							
circulatory system							
respiratory system	1	13	9		3		2
digestive system		22	21				1
urinary and genital system		1	1				
locomotive system		3	3				
integumentary system		8	8				
Non-malignant tumors and cysts							
Total diseases	2	73	61		3		11
Wounds, injuries, and accidents	2	22	21			*1	2
Total	4	95	82		3	1	13

* *Vulnus laceratum*, knee, and tetanus.

South Pacific Station.

AGGREGATE, 1878.

[Average number of ships' companies, 555; total sick-days, 4,475; deaths, 2; ratio per thousand of cases treated to effectives, 529+; ratio in 1877-1,948+.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic	1	49	47		1	1	1
Enthetic	3	16	16				2
Dietic	1	3	3				1
Diathetic	1	33	30		2		2
Developmental							
Tubercular							
Parasitic							
Of the nervous system	1	21	20		1		1
eye		1	1				
ear		2	1				1
teeth		1	1				
circulatory system							
respiratory system	1	39	35		3		2
digestive system	1	58	58		2		1
urinary and genital system	1	14	14		1		
locomotive system		5	4		1		
integumentary system	2	40	41		1		
Non-malignant tumors and cysts							
Total diseases	12	282	269		13	1	11
Wounds, injuries, and accidents	4	90	88		3	1	2
Total	16	372	357		16	2	13

ASIATIC STATION.

The geographic limits of this station are the eastern coast of Asia and the adjacent islands.

The following vessels were employed on this station: Tennessee (flag-ship), Monongahela, Kearsarge, Monocacy, Ashuelot, Alert, Ranger, and Palos.

The usual tables are appended.

The deaths were: from febris remittens, 1; apncea, 1; dysentery ac., 1; phthisis pneumon. chron., 1; cholera, 2; febris interica, 1; fractura cervical vertebra, 1; alcoholism, 1; morbi valvulorum cordis, 1; pneumonia, 1; diarrhœa, ac., 1.

During the third quarter a slight epidemic of cholera appeared on board the Monongahela; six cases and two deaths are reported.

Palos, 4th rate. Iron; screw; 306 tons.

[Employed during the year on the Asiatic Station. Average number of ship's company, 47; total sick-days, 237; deaths, 6; ratio per thousand of cases treated to effectives, 510 +.]

Diseases.	Remaining.	Admitted.	d.	Discharged from service.	Transferred.	Disch.	Remaining.
Miasmatic.....		1	1				
Enthetic.....		1					1
Dietic.....							
Diathetic.....							
Developmental.....							
Tubercular.....							
Parasitic.....		1	1				
Of the nervous system.....		1	1				
eye.....							
ear.....							
teeth.....							
circulatory system.....							
respiratory system.....		2	2				
digestive system.....		11	10				1
urinary and genital system.....		2	1				1
locomotive system.....							
integumentary system.....							
Non-malignant tumors and cysts.....							
Wounds, injuries, and accidents.....		5	5				
Total.....		24	21				3

Tennessee, flag-ship; 2d rate. Wood; screw; 2,840 tons.

[Employed during first, second, and third quarters, 1878, as flag-ship of the Asiatic Station. Average number of ship's company, 444; total sick-days, 5,839; deaths, 4; ratio per thousand of cases treated to effectives, 934 +.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic.....	3	34	35	.....	1	*1	.....
Enthetic.....	1	17	16	.....	2	.....	.....
Dietic.....	.....	7	7	.....	.....	.....	.....
Diathetic.....	1	54	49	.....	6	.....	.....
Developmental.....	.....	.....	.....	.....	.....	.....	.....
Tubercular.....	.....	.....	.....	.....	.....	.....	.....
Parasitic.....	.....	.....	.....	.....	.....	.....	.....
Of the nervous system.....	.....	37	30	.....	7	.....	.....
eye.....	.....	6	3	.....	3	.....	.....
ear.....	2	2	4	.....	.....	.....	.....
teeth.....	.....	.....	.....	.....	.....	.....	.....
circulatory system.....	.....	8	4	.....	4	.....	.....
respiratory system.....	2	28	22	.....	6	*12	.....
digestive system.....	4	92	92	.....	3	1	.....
urinary and genital system.....	1	8	7	.....	2	.....	.....
locomotive system.....	.....	3	2	.....	1	.....	.....
integumentary system.....	4	39	41	.....	2	.....	.....
Non-malignant tumors and cysts.....	.....	.....	.....	.....	.....	.....	.....
Wounds, injuries, and accidents.....	.....	62	59	.....	3	.....	.....
Total.....	18	397	371	.....	40	4	.....

*Fibris remit.

*†Phthis. pneumon. chron., 1; Aphnoea, 1.

‡Dysentery ac.

Kearsarge, 3d rate. Wood; screw; 695 tons.

[Fourteen days at navy-yard Portsmouth, N. H., after returning from the Asiatic Station. Ship's company, 120; sick-days, 61; deaths, 0.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic.....
Enthetic.....	1	.....	.....	1	.....	.....
Dietic.....
Diathetic.....
Developmental.....
Tubercular.....
Parasitic.....
Of the nervous system.....
eye.....
ear.....
teeth.....
circulatory system.....
respiratory system.....	3	1	3	1	.....	.....	.....
digestive system.....	2	.....	.....	2	.....	.....
urinary and genital system.....
locomotive system.....
integumentary system.....	3	2	3	1	1	.....	.....
Non-malignant tumors and cysts.....
Wounds, injuries, and accidents.....	2	1	.....	1	.....	.....
Total.....	6	8	7	2	5	.....	.....

Ranger, 3d rate. Iron; screw; 541 tons.

Employed during the year on the Asiatic Station. Average number of ship's company, 141; total sick-days, 1,196; deaths, 0. Ratio per thousand of cases treated to effectives, 1,003 +.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic.....	1	23	21		3		
Enthetic.....		9	8				1
Dietic.....		22	20		2		
Diathetic.....							
Developmental.....							
Tubercular.....							
Parasitic.....							
Of the nervous system.....		5	5				
eye.....		2	2				
ear.....		2	2				
teeth.....							
circulatory system.....							
respiratory system.....		8	8				
digestive system.....		21	21				
urinary and genital system.....		4	4				
locomotive system.....		3	3				
integumentary system.....		26	25		1		
Non-malignant tumors and cysts.....							
Wounds, injuries, and accidents.....	1	14	13		2		
Total.....	2	139	132		8		1

Monongahela, 2d rate. Wood; screw; 960 tons.

[Employed during the year on the Asiatic Station. Average number of ship's company, 254; total sick-days, 3,948; deaths, 6. Ratio per thousand of cases treated to effectives, 612 +.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic.....		28	25			*3	
Enthetic.....	1	19	17		1		3
Dietic.....		3	3				
Diathetic.....	1	22	18		4		1
Developmental.....							
Tubercular.....							
Parasitic.....							
Of the nervous system.....		3	2		1		
eye.....		2	2				
ear.....		2	2				
teeth.....							
circulatory system.....							
respiratory system.....		42	39		1	1	1
digestive system.....		174	170		2	1	1
urinary and genital system.....		16	14		1		1
locomotive system.....							
integumentary system.....	2	41	42				1
Non-malignant tumors and cysts.....							
Wounds, injuries, and accidents.....	3	56	53		3	§1	2
Total.....	7	408	387		13	6	9

*2 cholera, 1 febris enterica.

†Pneumonia.

‡Fract. cervical vertebra.

§Diarrhœa, ac.

Ashuelot, 3d rate. Iron; paddle; 786 tons.

[Employed during the year on the Asiatic Station. Average number of ship's company, 117; total number of sick-days, 1,341; deaths, 0. Ratio per thousand of cases treated to effectives, 1,059 +.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic	1	7	8				
Enthetic		34	31		2		1
Dietic		2	3				
Diathetic		5	3		2		
Developmental							
Tubercular							
Parasitic							
Of the nervous system		1	1				
eye		3	3		1		
ear							
teeth							
circulatory system							
respiratory system	1	2	3				
digestive system		33	33				
urinary and genital system		14	13		1		
locomotive system		2	2				
integumentary system		5	3		2		
Non-malignant tumors and cysts							
Wounds, injuries, and accidents	1	13	13		2		
Total	3	121	113		10		1

Alert, 3d rate. Iron; screw; 541 tons.

[Employed during the year on the Asiatic Station. Average number of ship's company, 143; total number of sick-days, 2,309; deaths, 1. Ratio per thousand of cases treated to effectives, 1,454 +.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic		22	18		3		3
Enthetic		9	7		3		
Dietic		2	2				
Diathetic		2	2				
Developmental							
Tubercular							
Parasitic							
Of the nervous system		7	7				
eye		1			1		
ear		2	2				
teeth							
circulatory system		2				*1	
respiratory system	2	28	26		3		1
digestive system		58	56		1		1
urinary and genital system		13	13				
locomotive system							
integumentary system		25	25				
Non-malignant tumors and cysts		1	1				
Wounds, injuries, and accidents		34	33		1		
Total	2	206	192		11	1	4

* Morbi valvulorum cordis.

Monocacy, 3d rate. Iron; paddle; 746 tons.

[Employed during the year on the Asiatic Station. Average number of ship's company, 136; total sick-days, 1,780; deaths, 1. Ratio per thousand of cases treated to effectives, 1,419+.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic.....		18	18				
Enthetic.....		24	18		3		1
Dietic.....		9	8			*1	
Diathetic.....		10	7		2		1
Developmental.....							
Tubercular.....							
Parasitic.....							
Of the nervous system.....		9	8	1			
eye.....		5	4		1		
ear.....		2	2				
teeth.....							
circulatory system.....		1	1				
respiratory system.....	1	16	13		4		
digestive system.....	2	42	42		2		
urinary and genital system.....		10	4		6		
locomotive system.....		1	1				
integumentary system.....		9	9				
Non-malignant tumors and cysts.....							
Wounds, injuries, and accidents.....	1	33	31		3		
Total.....	4	189	166	1	23	1	2

* Alcoholism.

First quarter, 1878. Asiatic Station.

[Aggregate: Total number of ships' companies, 1,498; total number of sick-days, 4,736; deaths, 3.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic.....	5	39	41		2	*1	
Enthetic.....	2	26	19		1		8
Dietic.....		9	9				
Diathetic.....	2	32	29		1		4
Developmental.....							
Tubercular.....							
Parasitic.....		1	1				
Of the nervous system.....		26	20	1			5
eye.....		3	2		1		
ear.....	2	3	5				
teeth.....							
circulatory system.....		3	3				
respiratory system.....	9	28	29	1	1	†1	5
digestive system.....	6	101	99		2		5
urinary and genital system.....	1	10	8				3
locomotive system.....		3	3				
integumentary system.....	9	45	44	1	2		7
Non-malignant tumors and cysts.....							
Total diseases.....	34	329	312	3	10	3	37
Wounds, injuries, and accidents.....	6	97	89		1		13
Total.....	42	426	401	3	11	3	50

* Feb. remit.

† Apnea.

; Dysentery ac.

Second quarter, 1878. Asiatic Station.

[Aggregate: Total number of ships' companies, 1,339; total number of sick-days, 6,603; deaths, 1.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic		51	46		3		3
Enthetic	8	38	37		3		6
Dietic		5	5				
Diathetic	4	56	42		6		12
Developmental							
Tubercular							
Parasitic							
Of the nervous system	5	27	26				5
eye		7	4				3
ear		2	1				1
teeth							
circulatory system		6	1				5
respiratory system	5	47	34		2	1	15
digestive system	5	147	139		1		12
urinary and genital system	3	26	21		3		5
locomotive system		5	3				2
integumentary system	7	45	47		1		4
Non-malignant tumors and cysts	1	1	1				
Total diseases	37	463	497		19	1	63
Wounds, injuries, and accidents	13	58	58		6		7
Total	50	521	465		25	1	80

* Phthisis pneumon. chron.

Third quarter, 1878. Asiatic Station.

[Aggregate: Total number of ships' companies, 1,278; total number of sick-days, 2,784; deaths, 4.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic	2	27	24			3	2
Enthetic	6	18	21		3		
Dietic		4	4				
Diathetic	12	13	19		6		
Developmental							
Tubercular							
Parasitic							
Of the nervous system	6	8	7		7		1
eye	3	3	1		4		
ear	1	5	6				
teeth							
circulatory system	5	1	1		5		
respiratory system	15	22	26		9		
digestive system	12	116	116		4		
urinary and genital system	5	12	12		3		
locomotive system	2	1	2		1		
integumentary system	4	42	41		3		
Non-malignant tumors and cysts							
Total diseases	73	272	280		45	3	1*
Wounds, injuries, and accidents	7	33	33		6	11	
Total	80	305	313		51	4	17

* Cholera, 2; febris enterica, 1.

† Fract. cervical vertebra.

Fourth quarter, 1878. Asiatic Station.

[Aggregate: Total number of ships' companies, 850; total number of sick-days, 2,585; deaths, 4.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic.....	2	17	15	.....	2	.....	2
Enthetic.....	.....	27	17	.....	4	.....	6
Dietic.....	.....	5	4	.....	.....	1	.....
Diathetic.....	.....	14	9	.....	3	.....	2
Developmental.....	.....	.....	.....	.....	.....	.....	.....
Tubercular.....	.....	.....	.....	.....	.....	.....	.....
Parasitic.....	.....	.....	.....	.....	.....	.....	.....
Of the nervous system.....	.....	3	2	.....	1	.....	.....
eye.....	1	6	6	.....	1	.....	.....
ear.....	.....	.....	.....	.....	.....	.....	.....
teeth.....	.....	.....	.....	.....	.....	.....	.....
circulatory system.....	.....	1	.....	.....	.....	1	.....
respiratory system.....	2	30	28	.....	2	1	1
digestive system.....	8	69	70	.....	3	1	3
urinary and genital system.....	2	19	15	.....	4	.....	2
locomotive system.....	.....	.....	.....	.....	.....	.....	.....
integumentary system.....	2	15	16	.....	.....	.....	1
Non-malignant tumors and cysts.....	.....	.....	.....	.....	.....	.....	.....
Total diseases.....	17	206	182	.....	20	4	17
Wounds, injuries, and accidents.....	.....	34	30	.....	2	.....	2
Total.....	17	240	212	.....	22	4	19

*Alcoholism.

†Morbi valvulorum cordis.

‡Pneumonia.

§Diarrhœa ac.

Asiatic Station.

AGGREGATE, 1878.

[Average number of ships' companies, 1,240; total sick-days, 16,710; deaths, 12; ratio per thousand of cases treated to effectives, 1,237 +; ratio in 1877, 1,230 +.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic.....	5	134	126	.....	7	4	2
Enthetic.....	2	109	94	.....	11	.....	6
Dietic.....	.....	23	22	.....	.....	1	.....
Diathetic.....	2	115	99	.....	16	.....	2
Developmental.....	.....	.....	.....	.....	.....	.....	.....
Tubercular.....	.....	.....	.....	.....	.....	.....	.....
Parasitic.....	.....	1	1	.....	.....	.....	.....
Of the nervous system.....	.....	64	55	1	8	.....	.....
eye.....	.....	19	13	.....	6	.....	.....
ear.....	2	10	12	.....	.....	.....	.....
teeth.....	.....	.....	.....	.....	.....	.....	.....
circulatory system.....	.....	11	5	.....	5	1	.....
respiratory system.....	9	127	117	1	14	3	1
digestive system.....	6	433	424	.....	10	2	3
urinary and genital system.....	1	67	56	.....	10	.....	2
locomotive system.....	.....	9	8	.....	.....	1	.....
integumentary system.....	9	147	148	1	6	.....	1
Non-malignant tumors and cysts.....	.....	1	1	.....	.....	.....	.....
Total diseases.....	36	1,270	1,181	3	94	11	17
Wounds, injuries and accidents.....	6	222	210	.....	15	1	2
Total.....	42	1,492	1,391	3	109	12	19

TRAINING AND PRACTICE SHIPS.

The vessels employed in this service were the Minnesota, Saratoga, and Mayflower. The usual tables are appended:

The deaths were, from pneumonia, 1; hemorrhage from stomach, 1.

Saratoga, 4th rate. Wood; sails; 757 tons.

[Employed during the year as training-ship. Average number of ship's company, 249; total sick-days, 1,233; deaths, 0; ratio per thousand of cases treated to effectives, 500 +.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic.....		18	10	1	7		
Enthetic.....		7	4		3		
Dietic.....		1	1				
Diathetic.....		12	8	1	3		
Developmental.....							
Tubercular.....		1			1		
Parasitic.....							
Of the nervous system.....		6	3	1	2		
eye.....		1			1		
ear.....		1	1		1		
teeth.....							
circulatory system.....		3	1		2		
respiratory system.....		19	11	1	7		
digestive system.....		24	21		3		
urinary and genital system.....		3	1		2		
locomotive system.....		2	1	1			
integumentary system.....							
Non-malignant tumors and cysts.....		2			2		
Wounds, injuries, and accidents.....	2	23	18		6		1
Total.....	2	123	80	5	39		1

Minnesota, 1st rate. Wood; screw; 3,000 tons.

[Employed during the year as training-ship. Average number of ship's company, 499; total sick-days, 3,576; deaths, 2; ratio per thousand of cases treated to effectives, 763 +.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic.....	1	24	23		1	*1	
Enthetic.....	1	18	11		2		
Dietic.....		5	4				1
Diathetic.....		25	13	3	9		
Developmental.....							
Tubercular.....		3			2		
Parasitic.....		15	8	4	3		
Of the nervous system.....		15	11		4		
eye.....		1		1			
ear.....							
teeth.....							
circulatory system.....		1	83	66	2	8	7
respiratory system.....	1	34	29	2	4	11	
digestive system.....		12	3	4	5		
urinary and genital system.....		1	1				
locomotive system.....	1	42	37		6		
integumentary system.....		2		1	1		
Non-malignant tumors and cysts.....		1	97	73	5	18	2
Wounds, injuries, and accidents.....							
Total.....	6	377	279	23	69	2	10

* Pneumonia.

† Hemorrhage from stomach. (Admitted with feb. remit.)

Mayflower, 4th rate. Screw; 306 tons.

[Employed during third quarter 1878 as practice-ship with cadet-engineers. Average number of ship's company, 84; total number of sick-days, 43; deaths, 0.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic.....		2	2				
Enthetic.....							
Dietic.....							
Diathetic.....							
Developmental.....							
Tubercular.....							
Parasitic.....							
Of the nervous system.....							
eye.....							
ear.....							
teeth.....							
circulatory system.....							
respiratory system.....		2	2				
digestive system.....		1			1		
urinary and genital system.....		1					
locomotive system.....							
integumentary system.....		2	1		1		
Non-malignant tumors and cysts.....							
Wounds, injuries, and accidents.....		2	2				
Total.....		9	7		2		

First quarter 1878. Training and practice ships.

[Aggregate: Total number of ships' companies, 765; total number of sick-days, 1,053; deaths, 1.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic.....	1	10	7		3	*1	1
Enthetic.....	1	7	3		4		1
Dietic.....		3	2				1
Diathetic.....		10	4		5		1
Developmental.....							
Tubercular.....		2			2		
Parasitic.....		5	4				1
Of the nervous system.....		4	2		2		
eye.....							
ear.....							
teeth.....							
circulatory system.....							
respiratory system.....	1	23	17		6		1
digestive system.....	1	14	12	2	1		
urinary and genital system.....		3	1		2		
locomotive system.....		1	1				
integumentary system.....	1	9	8		1		1
Non-malignant tumors and cysts.....		1			1		
Total diseases.....	5	92	81	2	27	1	6
Wounds, injuries, and accidents.....	3	29	23	1	4		4
Total.....	8	121	84	3	31	1	10

* Hemorrhage from stomach.

Second quarter 1878. Training and practice ships.

[Aggregate: Total number of ships' companies, 758; total number of sick-days, 977; deaths, 0.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic.....		7	6	1			
Enthetic.....	1	3	2		2		
Dietic.....	1	1	2				
Diathetic.....	1	13	7	1	4		2
Developmental.....							
Tubercular.....							
Parasitic.....							
Of the nervous system.....	1	1	1	1			
eye.....		5	4		1		
ear.....							
teeth.....							
circulatory system.....		2			2		
respiratory system.....	1	5	2	1	3		
digestive system.....		16	12		2		2
urinary and genital system.....		4	1	1	2		
locomotive system.....		1	1				
integumentary system.....	1	13	12		1		1
Non-malignant tumors and cysts.....		3		1	2		
Total diseases.....	6	74	50	6	19		5
Wounds, injuries, and accidents.....	4	34	24	1	9		4
Total.....	10	108	74	7	28		9

Third quarter 1878. Training and practice ships.

[Aggregate: Total number of ships' companies, 834; total number of sick-days, 1,308; deaths, 0.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic.....		20	19		1		
Enthetic.....		7	7				
Dietic.....		1	1				
Diathetic.....	2	11	8		2		3
Developmental.....							
Tubercular.....							
Parasitic.....		1		1			
Of the nervous system.....		11	5	1	4		1
eye.....		4	3		1		
ear.....		2	1	1			
teeth.....							
circulatory system.....		8	6		1		1
respiratory system.....		5	2	1			
digestive system.....	2	18	17		3		
urinary and genital system.....		5	2	1			2
locomotive system.....		2	1	1			
integumentary system.....	1	16	12		3		2
Non-malignant tumors and cysts.....							
Total diseases.....	5	106	82	5	15		9
Wounds, injuries, and accidents.....	4	31	23	1	6		5
Total.....	9	137	105	6	21		14

Fourth quarter 1878. Training and practice ships.

[Aggregate: Total number of ships' companies, 721; total number of sick-days, 1,514; deaths, 1.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic.....		7	3		4		
Enthetic.....		8	3		5		
Dietic.....		1					1
Diathetic.....	3	3	2	3	1		
Developmental.....		1			1		
Tubercular.....		1					
Parasitic.....							
Of the nervous system.....	1	4	1	3	1		
eye.....		3	2		1		
ear.....							
teeth.....							
circulatory system.....		1	1				
respiratory system.....	1	98	54	2	5	*1	7
digestive system.....		11	9		2		
urinary and genital system.....	2	3		2	3		
locomotive system.....							
integumentary system.....	2	6	6		2		
Non-malignant tumors and cysts.....							
Total diseases.....	9	116	81	10	25	1	8
Wounds, injuries, and accidents.....	5	28	23	2	5		3
Total.....	14	144	104	12	30	1	11

* Pneumonia

Training and practice ships.

AGGREGATE, 1878.

[Average number of ships' companies, 769; total sick-days, 4,852; deaths, 2. Ratio per thousand of cases treated to effectives, 1,493+. Ratio in 1877, 612+.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic.....	1	44	35	1	8	1	
Enthetic.....	1	25	15		11		
Dietic.....		6	5				1
Diathetic.....		37	21	4	12		
Developmental.....							
Tubercular.....		1		1	1		
Parasitic.....		3			2		
Of the nervous system.....		21	11	5	5		
eye.....		16	11		5		
ear.....		2	1	1			
teeth.....							
circulatory system.....		3	1		2		
respiratory system.....	1	104	79	3	15	1	7
digestive system.....	1	59	50	2	8		
urinary and genital system.....		15	4	4	7		
locomotive system.....		4	3		1		
integumentary system.....	1	44	38		7		
Non-malignant tumors and cysts.....		4		1	3		
Total diseases.....	5	388	274	22	87	2	8
Wounds, injuries, and accidents.....		122	93	5	24		
Total.....	5	510	367	27	111	2	8

SPECIAL SERVICE.

During the year 1877 the vessels employed on special service were: Rio Bravo, Ticonderoga, Constellation, Guard, Supply, Constitution, Gettysburg, Michigan, Tallapoosa, Portsmouth, Wyoming. The Rio Bravo was at Brownsville, Tex., Ticonderoga on the coast of Africa, Guard on the coast of Brazil, Gettysburg in Europe, Michigan on the lakes, Tallapoosa dispatch vessel on home station, Portsmouth, Wyoming, Constitution, Supply, and Constellation on special duty in connection with the American exhibit at the Paris Exposition.

Nothing special is to be observed beyond the determination of the disease-rates of these vessels.

The usual tables are appended.

The deaths were, from fracture base of cranium, 1; drowned, 2; phthisis pulmon., chron., 1; febris remit., 1; erysipelas, 1; pneumonia, 1.

Rio Bravo, 4th rate. Paddle; 325 tons.

[Stationed at Brownsville, Tex. Average number of ships' company, 55: total sick-days, 1,037; deaths, 0. Ratio per thousand of cases treated to effectives, 3,563+.

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic		21	21				
Enthetic	1	31	27	4			1
Dietic		10	10				
Diathetic		1	1				
Developmental							
Tubercular							
Parasitic		1	1				
Of the nervous system		6	6				
eye		2	2				
ear		1	1				
teeth		6	6				
circulatory system							
respiratory system		29	27		2		
digestive system		34	34				
urinary and genital system		3	3				
locomotive system		1		1			
integumentary system		16	16				
Non-malignant tumors and cysts							
Wounds, injuries, and accidents		33	31		2		
Total	1	195	186	5	4		1

Ticonderoga, 2d rate. Wood; screw; 1,019 tons.

[Employed during fourth quarter on special duty on the coast of Africa. Average number of ship's company, 266; total sick-days, 393; deaths, 0; ratio per thousand of cases treated to effectives, 207+.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic.....		2	2				
Enthetic.....		1					1
Dietic.....							
Diathetic.....		8	5				3
Developmental.....							
Tubercular.....							
Parasitic.....							
Of the nervous system.....		2	1				1
eye.....		1	1				
ear.....							
teeth.....							
circulatory system.....							
respiratory system.....		10	10				
digestive system.....		6	4				2
urinary and genital system.....		2	2				
locomotive system.....							
integumentary system.....		5	1		1		3
Non-malignant tumors and cysts.....							
Wounds, injuries, and accidents.....		18	12				6
Total.....		55	38		1		16

Constellation, 3d rate. Wood; sails; 1,236 tons.

[Employed first, second, and third quarters in Europe, on duty in connection with the American exhibit at the Paris Exposition. Average number of ship's company, 248; total number of sick-days, 1,315; deaths, 0; ratio per thousand of cases treated to effectives, 489+.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic.....		4	4				
Enthetic.....		9	8		1		
Dietic.....		1	1				
Diathetic.....		3	1		2		
Developmental.....							
Tubercular.....							
Parasitic.....							
Of the nervous system.....							
eye.....		8	8				
ear.....							
teeth.....							
circulatory system.....							
respiratory system.....		13	8		5		
digestive system.....		28	28				
urinary and genital system.....		2	2				
locomotive system.....							
integumentary system.....		20	19		1		
Non-malignant tumors and cysts.....							
Wounds, injuries, and accidents.....		34	33		1		
Total.....		122	112		10		

Guard, 4th rate. Wood; sails; 925 tons.

[Engaged during the year on special surveying duty on coast of Brazil. Average number of ship's company, 101; total sick-days, 507; deaths, 1; ratio per thousand of cases treated to effectives, 610+.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic.....		3	3			*1	
Enthetic.....		9	9				
Dietic.....							
Diathetic.....		9	6		3		
Developmental.....							
Tubercular.....							
Parasitic.....							
Of the nervous system.....		1	1				
eye.....		1	1				
ear.....							
teeth.....							
circulatory system.....		2			2		
respiratory system.....					1		
digestive system.....		17	16				
urinary and genital system.....		3	3				
locomotive system.....							
integumentary system.....		2	2				
Non-malignant tumors and cysts.....							
Wounds, injuries, and accidents.....		14	11		3		
Total.....		61	51		9	1	

* Febris remit.

Supply, 4th rate. Wood; sails; 547 tons.

[Employed during the year in Europe on duty in connection with the American exhibit at the Paris Exposition. Average number of ship's company, 80; total number of sick-days, 591; deaths, 1; ratio per thousand of cases treated to effectives, 600+.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic.....		5	4		1		
Enthetic.....		1	1				
Dietic.....		1	1				
Diathetic.....		1	1				
Developmental.....							
Tubercular.....							
Parasitic.....							
Of the nervous system.....		1			1		
eye.....		1	1				
ear.....							
teeth.....							
circulatory system.....							
respiratory system.....		15	13		2		
digestive system.....		3	3				1
urinary and genital system.....		2	1				1
locomotive system.....		1	1				
integumentary system.....		6	6				
Non-malignant tumors and cysts.....							
Wounds, injuries, and accidents.....		11	9		1	*1	
Total.....		48	40		5	1	2

* Erysipelas following fracture of leg.

Constitution, 3d rate. Wood; sails; 1,335 tons.

[Employed during the year in Europe on duty in connection with the American exhibit at the Paris Exposition. Average number of ship's company, 186; total number of sick-days, 1,533; deaths, 2; ratio per thousand of cases treated to effectives, 1,698 +.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic		8	8				
Enthetic		5	3		1		1
Dietic	1	3	4				
Diathetic		4	3		1		
Developmental							
Tubercular							
Parasitic							
Of the nervous system		2	1		1		
eye		2	2				
ear		2	1		1		
teeth							
circulatory system							
respiratory system		20	18				2
digestive system		15	15				
urinary and genital system		6	6				
locomotive system	1	3	4				
integumentary system		16	16				
Non-malignant tumors and cysts							
Wounds, injuries, and accidents	1	27	22		2	2	2
Total	3	113	103		6	2	5

* Fracture base of cranium, 1; drowning, 1.

Gettysburg, 4th rate. Iron; paddle; 518 tons.

[Employed on special service on the European Station. Average number of ship's company, 27; total number of sick-days, 1,239; deaths, 0; ratio per thousand of cases treated to effectives, 1,597 +.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic		20	17		2		1
Enthetic		8	8				
Dietic		4	3		1		
Diathetic	1	14	12		3		
Developmental							
Tubercular							
Parasitic		1	1				
Of the nervous system		4	4				
eye		2	2				
ear		1	1				
teeth		1	1				
circulatory system		2			2		
respiratory system	1	25	23		3		
digestive system		28	28				
urinary and genital system		3	1		1		1
locomotive system							
integumentary system		15	15				
Non-malignant tumors and cysts							
Wounds, injuries, and accidents		25	25				
Total	2	153	141		12		2

Michigan, 3d rate. Iron; paddle; 450 tons.

[Employed on the lakes. Average number of ship's company, 100; total sick-days, 699; deaths, 1; ratio per thousand of cases treated to effectives, 570+.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic.....		15	15				
Enthetic.....							
Dietic.....		1	1				
Diathetic.....		2	2				
Developmental.....							
Tubercular.....							
Parasitic.....							
Of the nervous system.....							
eye.....		1	1				
ear.....		3	3				
teeth.....							
circulatory system.....							
respiratory system.....		11	9			1*	1
digestive system.....		5	4				1
urinary and genital system.....		5	5				
locomotive system.....		1	1				
integumentary system.....		2	2				
Non-malignant tumors and cysts.....							
Wounds, injuries, and accidents.....		11	11				
Total.....		57	54			1	2

* Pneumonia.

Tallapoosa, 4th rate. Wood; paddle; 650 tons.

[Employed as freight and dispatch vessel on the North Atlantic Station. Average number of ship's company, 120; total sick-days, 383; deaths, 0; ratio per thousand of cases treated to effectives, 558+.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic.....		10	8		2		
Enthetic.....		3	2		1		
Dietic.....							
Diathetic.....		5	4		1		
Developmental.....							
Tubercular.....							
Parasitic.....							
Of the nervous system.....		5	4		1		
eye.....							
ear.....							
teeth.....		2	2				
circulatory system.....							
respiratory system.....		16	15		1		
digestive system.....		9	9				
urinary and genital system.....							
locomotive system.....							
integumentary system.....		3	3				
Non-malignant tumors and cysts.....							
Wounds, injuries, and accidents.....		14	12		2		
Total.....		67	59		8		

Portsmouth, 3d rate. Wood; sails; 846 tons.

[Employed in Europe on special duty in connection with the American exhibit at the Paris Exposition. Average number of ship's company, 146; total number of sick-days, 1,593; ratio per thousand of cases treated to effectives, 1,849+.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic		72	70				2
Enthetic		14	12		2		
Dietic		11	11				
Diathetic	1	9	7		1		2
Developmental							
Tubercular		2	2				
Parasitic							
Of the nervous system		18	16		2		
eye		6	5		1		
ear		1	1				
teeth							
circulatory system		3	1		2		
respiratory system	1	25	20	1	5		
digestive system	1	15	14				2
urinary and genital system		16	13	1	2		
locomotive system		5	2		3		
integumentary system		22	22				
Non-malignant tumors and cysts							
Wounds, injuries, and accidents		48	47		1		
Total	3	267	243	2	19		6

Wyoming, 3d rate. Wood; screw; 726 tons.

[Employed first, second, and third quarters on North Atlantic coast; fourth quarter in Europe on duty in connection with American exhibit at the Paris Exposition. Average number of ship's company, 183; total sick-days, 1,617; deaths, 2; ratio per thousand of cases treated to effectives, 934+.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic		24	24				
Enthetic		6	6				
Dietic		3	2		1		
Diathetic		14	8	1	4		1
Developmental							
Tubercular		1		1			
Parasitic		2	2				
Of the nervous system		4	2	1	1		
eye		2	2				
ear							
teeth							
circulatory system		3	1		2		
respiratory system	1	30	23	1	6	1*	
digestive system		21	20				1
urinary and genital system		4	1		3		
locomotive system							
integumentary system		17	15		1		1
Non-malignant tumors and cysts							
Wounds, injuries, and accidents		39	34		2	1†	2
Total	1	170	140	4	20	2	5

* Pthisis pneumon. chron.

† Drowned.

First quarter 1878. Special service.

[Aggregate: Total number of ships' companies, 1,321; total number of sick-days, 1,811; deaths, 3.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic.....	1	32	31		1		4
Enthetic.....	1	18	10	1	4		
Dietic.....	1	2	3				1
Diathetic.....	2	11	8		4		
Developmental.....							1
Tubercular.....		1	1				
Parasitic.....		7	5		2		1
Of the nervous system.....		2	1				
eye.....		4	4				
ear.....							
teeth.....							
circulatory system.....	3	58	42	2	8	1*	8
respiratory system.....	1	29	28				1
digestive system.....	1	8	5	1	1		1
urinary and genital system.....	1	6	3		3		1
locomotive system.....		28	24		1		3
integumentary system.....							
Non-malignant tumors and cysts.....							
Total diseases.....	10	207	163	4	24	1	23
Wounds, injuries, and accidents.....	1	56	42		4	2†	9
Total.....	11	263	207	4	28	3	32

* Phthisis pneumon. chron.

† Fracture of base of cranium; 1 drowned.

Second quarter 1878. Special service.

[Aggregate: Total number of ships' companies, 1,252; total number of sick-days, 3,187; deaths, 2.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic.....		53	47		2	1*	3
Enthetic.....	4	27	23	1			1
Dietic.....		5	4				1
Diathetic.....	1	16	12		2		3
Developmental.....							
Tubercular.....	1	1	1	1			
Parasitic.....		1	1				
Of the nervous system.....		12	9		1		3
eye.....	1	12	12				1
ear.....		1	1		1		
teeth.....		2	2				
circulatory system.....		5	1		2		1
respiratory system.....	8	34	31		4		1
digestive system.....	12	41	40		1		3
urinary and genital system.....	2	10	7		2		3
locomotive system.....	1	4	4	1			
integumentary system.....	3	28	29				2
Non-malignant tumors and cysts.....							
Total diseases.....	23	251	222	3	15	1	33
Wounds, injuries, and accidents.....	9	51	53		3	1†	3
Total.....	32	302	275		18	2	36

* Feb. remit.

† Drowning.

Third quarter 1878. Special service.

[Aggregate: Total number of ships' companies, 1,578; total number of sick-days, 3,267; deaths, 1.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic	3	65	60				3
Enthetic	7	32	34	1	1		3
Dietic	1	15	16				
Diathetic	3	22	15		6		4
Developmental							
Tubercular		2	2				
Parasitic		1	1				
Of the nervous system	2	16	15		3		
eye	1	7	8				
ear		2	1				1
teeth		5	4				1
circulatory system	2	2			4		
respiratory system	7	38	32		10		3
digestive system	2	70	66				6
urinary and genital system	3	20	18		3		2
locomotive system							
integumentary system	2	41	43				
Non-malignant tumors and cysts							
Total diseases	33	338	315	1	29		26
Wounds, injuries, and accidents	3	78	75		3	1*	2
Total	36	416	390	1	32	1	28

* Erysipelas following fracture of leg.

Fourth quarter 1878. Special service.

[Aggregate: Total number of ships' companies, 1,434; total number of sick-days, 3,070; deaths, 1.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic	6	57	60				3
Enthetic	3	16	15	1			3
Dietic		16	14		2		
Diathetic	4	24	19	1	4		4
Developmental							
Tubercular		2	2				
Parasitic		1	1				
Of the nervous system		13	11	1			1
eye		5	5				
ear	1	2	2	1			
teeth	1	2	3				
circulatory system		1	1				
respiratory system	3	73	67		5	1*	3
digestive system	6	43	42				7
urinary and genital system	2	16	16				2
locomotive system		1	1				
integumentary system		33	27		2		4
Non-malignant tumors and cysts							
Total diseases	26	305	286	4	13	1	27
Wounds, injuries, and accidents	2	85	73		4		10
Total	28	390	359	4	17	1	37

* Pneumonia.

Special service.

AGGREGATE, 1878.

[Average number of ships' companies, 1,395; total sick-days, 11,335; deaths, 7. Ratio per thousand of cases treated to effectives, 972 +; ratio in 1877, same.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic.....		207	198		5	1	3
Enthetic.....	1	93	82	4			3
Dietic.....	1	38	37		2		
Diathetic.....	2	49	35		12		4
Developmental.....							
Tubercular.....		5	4	1			
Parasitic.....		4	4				
Of the nervous system.....		48	40	1	6		1
eye.....		26	26				
ear.....		9	9	1	1		
teeth.....		8	2				
circulatory system.....		8			6		
respiratory system.....	3	203	172	2	27	2	3
digestive system.....	1	183	176		1		2
urinary and genital system.....	1	54	46	1	6		
locomotive system.....	1	11	8	1	3		
integumentary system.....		130	123		3		4
Non-malignant tumors and cysts.....							
Total diseases.....	10	1,077	969	11	77	3	27
Wounds, injuries, and accidents.....	1	270	243		14	4	10
Total.....	11	1,347	1,212	11	91	7	37

COAST SURVEY.

The vessels employed on the Coast Survey Service from which returns have been received were the *Gedney* and *Bache*.

These vessels are officered and manned from the Navy.

Both these vessels were employed on the coast of Florida.

The usual tables are appended.

Gedney, Coast Survey.

[Employed during the fourth quarter on the coast of Florida. Average number of ship's company, 33; total sick-days, 6; deaths, 0.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic.....							
Enthetic.....							
Dietic.....							
Diathetic.....							
Developmental.....							
Tubercular.....							
Parasitic.....							
Of the nervous system.....							
eye.....							
ear.....							
teeth.....							
circulatory system.....							
respiratory system.....		1			1		
digestive system.....							
urinary and genital system.....							
locomotive system.....							
integumentary system.....							
Non-malignant tumors and cysts.....							
Wounds, injuries, and accidents.....							
Total.....		1			1		

Bache, Coast Survey.

[Employed second and fourth quarters on the coast of Florida, and third quarter at New London, Conn.
Average number of ship's company, 123; total number of sick-days, 70; deaths, 0.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic		3	3				
Enthetic	1	1	1				1
Dietic							
Diathetic		1	1				
Developmental							
Tubercular							
Parasitic							
Of the nervous system							
eye							
ear							
teeth							
circulatory system							
respiratory system		1	1				
digestive system		7	6		1		
urinary and genital system							
locomotive system							
integumentary system							
Non-malignant tumors and cysts							
Total diseases	1	13	12		1		1
Wounds, injuries, and accidents		3	2	1			
Total	1	16	14	1	1		1

Second quarter 1878. Coast Survey.

[Aggregate: Total number of ships' companies, 41; total number of sick-days, 31; deaths, 0.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic		3	3				
Enthetic		1					
Dietic							
Diathetic							
Developmental							
Tubercular							
Parasitic							
Of the nervous system							
eye							
ear							
teeth							
circulatory system							
respiratory system		1	1				
digestive system		3	3				
urinary and genital system							
locomotive system							
integumentary system							
Non-malignant tumors and cysts							
Total diseases		8	7				1
Wounds, injuries, and accidents		1					1
Total		9	7				2

Third quarter 1878. Coast Survey.

[Aggregate: Total number of ships' companies, 42; total number of sick-days, 11; deaths, 0.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic							
Enthetic	1		1				
Dietic		1	1				
Diathetic							
Developmental							
Tubercular							
Parasitic							
Of the nervous system							
eye							
ear							
teeth							
circulatory system							
respiratory system							
digestive system							
urinary and genital system							
locomotive system							
integumentary system							
Non-malignant tumors and cysts							
Total diseases	1	1	2				
Wounds, injuries, and accidents	1		1				
Total	2	1	3				

Fourth quarter, 1878. Coast Survey.

[Aggregate: Total number of ships' companies, 75; total number of sick-days, 34; deaths, 0.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic							
Enthetic							
Dietic							
Diathetic							
Developmental							
Tubercular							
Parasitic							
Of the nervous system							
eye							
ear							
teeth							
circulatory system							
respiratory system		1			1		
digestive system		4	3		1		
urinary and genital system							
locomotive system							
integumentary system							
Non-malignant tumors and cysts							
Total diseases		5	3		2		
Wounds, injuries, and accidents		2	1	1			
Total		7	4	1	2		

Coast Survey.

AGGREGATE, 1878.

[Average number of ships' companies, 158; total sick-days, 76; deaths, 0. Ratio per thousand of cases treated to effectives, 114+. Ratio in 1877, 692+.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic		3	3				
Enthetic		1	1				
Dietic							
Diathetic		1	1				
Developmental							
Tubercular							
Parasitic							
Of the nervous system							
eye							
ear							
teeth							
circulatory system							
respiratory system		2	1		1		
digestive system		7	6		1		
urinary and genital system							
locomotive system							
integumentary system							
Non-malignant tumors and cysts							
Total diseases		14	12		2		
Wounds, injuries, and accidents		3	1	2			
Total		17	13	2	2		

RÉSUMÉ.

The total sick-rate for the year was 885+ per thousand of effectives; that of the previous year was 904+.

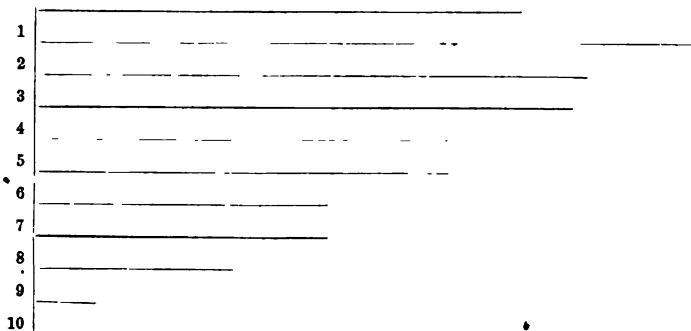
The mortality from disease was 41; that from wounds, injuries, and accidents was 12: 7 from drowning, 2 from fracture of the cranium, 1 from accidental poisoning, 1 from fracture of cervical vertebræ, 1 from laceration of knee and tetanus.

A general aggregate of the total diseases and casualties, with a graphic representation of the sick-rate of the various stations, and a station map suggesting attention to disease zones, are herewith appended.

General aggregate for sea-going vessels for the year 1878.

[Average number of men, 7,764; total sick-days, 67,427; deaths, 53. Ratio per thousand of cases treated to effectives, 885+.]

Diseases.	Remaining.	Admitted.	Discharged.	Discharged from service.	Transferred.	Died.	Remaining.
Miasmatic	16	912	847	1	49	22	9
Enthetic	16	517	437	10	60	.....	26
Dietic	3	143	135	.....	4	2	5
Diathetic	9	475	376	7	83	2	16
Developmental	1	2	1	.....	2	.....	.....
Tubercular .....	.....	6	4	1	1	.....	.....
Parasitic	1	13	11	1	2	.....	.....
Of the nervous system	3	315	250	10	48	.....	10
eye	3	117	94	.....	24	.....	2
ear	2	38	33	2	3	.....	2
teeth .....	.....	10	10	.....	.....	.....	.....
circulatory system .....	.....	49	24	.....	23	1	1
respiratory system	20	784	664	9	98	9	34
digestive system	10	1,130	1,072	2	45	3	18
urinary and genital system	5	253	202	8	38	1	9
locomotive system	1	44	34	1	9	.....	1
integumentary system	16	664	633	1	27	.....	19
Non-malignant tumors and cysts .....	.....	10	6	3	.....	1	.....
Total diseases	106	5,492	4,833	56	516	41	152
Wounds, injuries, and accidents	20	1,255	1,144	9	82	12	28
Total	126	6,747	5,977	65	598	53	180

Average number of men.

Graphic representation of the health of the Navy for the year 1878, as determined by the sick-rate per thousand of cases treated to effectives.

1. Training and practice ships	1,493+
2. North Pacific station	1,263+
3. Asiatic station	1,237+
4. European station	972+
5. Special-service ships	872+
6. North Atlantic station	722+
7. South Atlantic station	719+
8. South Pacific station	529+
9. Coast Survey vessels	114+
10. Sick-rate for the year	885+

At the close of the year 1877, there remained under medical treatment 429 cases; during the year 1878 there occurred 11,084 cases of disease, injury, &c., making a total of 11,513 cases treated during the year, of

which number 106 died, 9,711 were returned to duty, 314 discharged from the service, and 464 remained under treatment at the close of the year.

The average strength of the Navy (officers, seamen, marines, engineer service, and Coast Survey included) for the year 1878, as near as can be ascertained, was 9,007. The ratio per thousand of cases treated to number of persons in the service was 1.278+; the ratio per thousand of deaths to number of persons in the service was .10+; and the ratio per thousand of deaths to number of persons under medical treatment was .08+.

The total number of deaths from all causes reported to the Navy Department from October 1, 1878, to October 1, 1879, was 114.

RECAPITULATION.

	Average number of officers and men on board in 1878.		Remaining under medical treatment Dec. 31, 1877.		Admitted in 1878.		Discharged to duty in 1878.		Discharged from the service in 1878.		Transferred in 1878.		Died in 1878.		Total treated in 1878.		Remaining under medical treatment Dec. 31, 1878.		Ratio per thousand of cases treated to effectives.		Ratio per thousand of deaths to effectives.		Ratio per thousand of deaths to number of persons treated.	
Naval hospitals.....	210	888	577	225	49	42	1,098	205	.....	38+														
Navy yards and stations.....	75	2,676	2,520	13	147	8	2,751	63	.....	3+														
Receiving-ships.....	1,243	18	637	11	124	3	791	16	.....	3+														
Sea-going vessels in commission.....	7,764	126	6,747	65	598	53	6,873	180	.....	6+														
Total.....	9,007	429	11,084	9,711	314	918	106	11,513	464	1,278+	10+	8+												

Summary of prevalent forms of disease on home and foreign service for the year ending December 31, 1898.

Station	{		North Atlantic.	South Atlantic.	European.	Pacific.	Asiatic.	Special service.		School and Coast Survey.	Total.
	Cases treated.	Deaths.	Cases treated.	Deaths.	Cases treated.	Deaths.	Cases treated.	Deaths.	Cases treated.	Deaths.	Cases treated.
Aggregate number of men	2,214.	581.	1,036.	1,419.	1,314.	959.	208.	75.	7,806.		
Order and class.											
CLASS I.											
Order I.											
ZYMOTIC DISEASES.											
Miasmatic diseases.											
Cholera epidemica	1						6	2			6
Cynanche parotidis	1										1
Dysentery	1						1				1
Erysipelas	26		4				3	1			10
Febris enterica	3	8	1	9			11		1		13
Febris continua simplex	24	13	1	1			3				2
Febris typhoidea	125	22	49	136			124	40	2		40
Febris intermittens	2	1	2	1			1				9
Febris recidiva	18	1	13	33			5	1			6
Febris remittens		2					1				1
Febris typhus		2	13				1	1			100
Morbili											7
Pyæmia			2								2
Vaccinia											1
Varicella	1		1	1							1
Variola	1		2								2
Febris chagras	2										3
Order II.											
Enthetic diseases.											
Gonorrhœa	26	3	33	20			34	17	2		204
Ophthalmia gonorrhœica			1	1			1				3
Syphilis primitiva	63	22	41	22			34	7			219
Syphilis consecutiva	34	7	20	13			4	5			122
Order III.											
Dietic diseases.											
Alcoholismus	25	6	16	14			20	7			100
Delirium tremens	4		1	1			6	1			18
Narcosis	1		3	1			1				13
Narcosis (use of opium)	1			1							1

CONSTITUTIONAL DISEASES.

Diabetic diseases.

Adynamia.....	12	12	28	1	23	15	19	4	111	1
Anemia.....			2		1	7	3	1	14	
Hydrops.....								1	12	
Pelagra.....	2	9	1		1				156	1
Rheumatismus acutus.....	34	7	33		8	44	30	10	207	
Rheumatismus chronicus.....	28	17	32		40	50	19	21	4	
Lumbago.....		4						1	1	
Neurodynia.....										
<i>Developmental diseases.</i>										
Degeneratio.....			3		1				1	
Senectus.....									3	
<i>Tubercular diseases.</i>										
Scrofula.....	2						1	1	4	
<i>PARASITIC DISEASES.</i>										
Scabies.....	1					1		2	3	
Vermes.....	1		4				4	1	11	
<i>LOCAL DISEASES.</i>										
<i>Diseases of the nervous system.</i>										
Cephalalgia.....	10		13		15	12	9		59	
Cerebritis.....	1					1	1		3	
Chorea.....			1				1		2	
Dementia.....	4				1	4			10	
Epilepsia.....	6	1	3		4	6	10	7	37	
Insolatio.....	3				1	1			10	
Irritatio spinalis.....	1				1	1			3	
Mania.....			2		2	1		1	6	
Melancholia.....	2		3			2	3	1	11	
Myelitis.....							1		1	
Nausea marina.....					1	1			2	
Neuralgia.....	19	2	40		27	26	9	5	128	
Noctalgia.....					3			2	9	
Paralysis.....	1	1				1	2	1	1	
Pleurodynia.....	1								1	
Congestio cerebri.....	1								6	
Sciatica.....	2	3				1		3	5	
Vortigo.....			4			2			9	
Lumbago.....			5						5	
Hepatalgia.....					1				1	

CLASS II.

Order I.

Order II.

Order III.

CLASS III.

CLASS IV.

Order I.

Summary of prevalent forms of disease on home and foreign service for the year ending December 31, 1878—Continued.

Station	{ North Atlantic.		South Atlantic.	European.	Pacific.	Asiatic.	Special service.	School and Coast Survey.	Total.
Aggregate number of men	2,214.	581.	1,086.	1,419.	1,314.	959.	208.	75.	7,806.
Order and class.	Cases treated.	Deaths.	Cases treated.	Cases treated.	Deaths.	Cases treated.	Deaths.	Cases treated.	Deaths.
LOCAL DISEASES—Continued.									
<i>Diseases of the eye.</i>									
<i>Order II.</i>									
Anaurosis					2				
Cataracts					1				2
Conjunctivitis	14	3	10	4	11	13	11		66
Hemeralopia			3		1				4
Iritis	3	1		3	2		2		11
Glaucoma	1								1
Myopia	1								1
Nystalopia	4								1
Ophthalmia			9		2	4	2		4
Pterygium	1								1
Retinitis									1
Ulcus corneae	1			1		2	1		3
<i>Order III.</i>									
<i>Diseases of the ear.</i>									
Otitis	2		2	1	3	1			9
Otitis		3	1	1	8	3			16
Otorrhoea	1		1	5	1	2	2		12
Sarclitis				2					2
<i>Diseases of the nose.</i>									
Ozena						1			1
Obstruction of lachrymal ducts						1			1
<i>Diseases of the teeth.</i>									
Montalgia	14			1		0			24
<i>Diseases of the circulatory system.</i>									
<i>Order IV.</i>									
Angina pectoris				6			1		7
Hypertrophica corollae	1		2		1	5			9
Morbi valvularum corollae			2		8	1	1		7
Papillatio			4		6	1			22
Pericarditis	2	1							3
Varix	1				1				2

Diseases of the respiratory system.

<i>Asyma</i>	7	2	10	3	1	2	1	1	2	21	1	1	1	1
<i>Asthma</i>	30	26	50	36	41	45	41	41	45	21	2	2	2	26
<i>Bronchitis acuta</i>	0	2	2	5	9	9	9	9	9	1	1	1	1	243
<i>Bronchitis chronica</i>	42	2	54	28	56	79	56	56	79	14	1	1	1	276
<i>Catarrhus</i>														
<i>Epitaxis</i>														
<i>Hemoptysis</i>	1		8		6	1	6	6	1					16
<i>Laryngitis</i>					1	1	1	1	6	8				16
<i>Pathologia pneumonica acuta</i>	1		5		2	2	2	2	2	1				12
<i>Pathologia pneumonica chronica</i>	4		3		7	12	7	12	1	4				41
<i>Pleuritis</i>	3		4		5	6	5	6	14	6				48
<i>Pneumonia</i>	5	1	8	1	6	13	6	13	7	1				41
														3
<i>Diseases of the digestive system.</i>														
<i>Ascites</i>	1				20	5			5					1
<i>Cholera morbus</i>	4		2		9									40
<i>Cirrhosis hepatis</i>			1		1									1
<i>Colica</i>	11	2	0		8	16	27	8	16	4	2			79
<i>Congestio hepatis</i>					1									1
<i>Diarrhoea acuta</i>	4	1	9		5	9	3	5	9	3				34
<i>Diarrhoea chronica</i>	61	6	43		315	56	315	42	24	1	1			540
<i>Dysenteria acuta</i>		2	1		2	1	10	2	1	3				18
<i>Dysenteria chronica</i>	12	5	8		16	9	16	5	1	10				67
<i>Dyspepsia</i>					1									1
<i>Enteritis</i>	5	1	11		10	14	13	10	1	1				55
<i>Fistula in ano</i>														1
<i>Gastritis</i>	1	1	2		3	1	3	2	1	1				10
<i>Gastrodynia</i>	2	1	3		1		1							9
<i>Hematomeles</i>														6
<i>Hemorrhoids</i>														2
<i>Hepatitis acuta</i>	11	1	6		14	2	14	1	2	3				42
<i>Hepatitis chronica</i>		1	1		3	3	3	1	3	1				9
<i>Icterus</i>		3	10		1	2	1	2	2	1				1
<i>Pharyngitis</i>	2													24
<i>Prolapsus ani</i>	1		1		1	10	1	1	2	2	2			32
<i>Splenitis</i>	1				15	1	1	1	1	1				2
<i>Stomatitis</i>														1
<i>Tonsillitis</i>		1	1		1	1	11	1	2	2				5
<i>Perityphlitis</i>	30	6	25		14	30	11	14	18	1	1			185
<i>Volvulus</i>		1												1
<i>Nausea</i>		1			1									1
<i>Diseases of the urinary and genital system.</i>														
<i>Albuminuria</i>	2				1		1							4
<i>Balanitis</i>														1
<i>Calculus</i>														1
<i>Cystitis</i>	2	1	1		5	2	11	5	2	1				22
<i>Dysuria</i>														3
<i>Faurelis</i>	1				2		1		2	5				11

Order VII

Order VI

Order VIII

Summary of prevalent forms of disease on home and foreign service for the year ending December 31, 1873—Continued.

Station	{ North Atlantic.		South Atlantic.	European.	Pacific.	Asiatic.	Special service.	School and Coast Survey.	Total.
Aggregate number of men	2,214.	581.	1,036.	1,419.	1,314.	959.	208.	75.	7,806.
Disease.	Cases treated.	Deaths.	Cases treated.	Deaths.	Cases treated.	Deaths.	Cases treated.	Deaths.	Cases treated.
LOCAL DISEASES—Continued.									
Diseases of the urinary and genital system—Continued.									
Fistula vesicæ	1								1
Hæmaturia		1					1		1
Hydrocele									
Ichthuria									
Nephritis	3								3
Orchitis	20	8	28	13	35	18			125
Paraphimosis	1	3		1					5
Phymosis	3			2					8
Spermatorrhœa	2								4
Urethra strictura	2	3	6	3	11	8	1		4
Varicocele			1			1			1
Diabetes		1	3		2		1		4
Diseases of the locomotive system.									
Arthritis									
Ankylosis		1	1			4	1		7
Coxalgia			1			1			4
Hydrops articuli							1		3
Necrosis									1
Periostitis	2					1			2
Synovitis		2	2	10	4	6			24
Theuritis									1
Diseases of the integumentary system.									
Abercusis	26	6	34	13	34	43	18		174
Acne		1							2
Adenitis		5							5
Arthritis	13		11	14	30	15	5		97
Ecthyma	4		4	7	7	3	1		21
Eczema									3
Ptythina	1					4			12
									4

[illegible]

Furunculus	23	0	38	63	54	26	14	224									
Herpes		1	5	3	2	3	2	16									
Impetigo			1					1									
Lichen					3	1		5									
Onychia			1					1									
Paronychia	6	5	5	10	6	6	5	43									
Pernio	1				1	6	1	9									
Portio	1							1									
Prurigo					2			3									
Psoriasis					3		1	4									
Ungula involutis	1				1	1	1	3									
Ulcus	6	11	3	14	6			40									
Uticaria	1	1	1					3									
Rosolia			3					3									
NON-MALIGNANT TUMORS AND CYSTS.																	
Adenoma			1					1									
Cystis		1					4	5									
Lipoma					1			1									
Tumor cerebri		1	1					1									
Hematuria			2					2									
VIOLENT DISEASES AND DEATHS.																	
<i>Wounds, injuries, and accidents.</i>																	
Abrasio	5		3	2	8	13	12	45									
Ambustio	8		6	10	17	11	10	62									
Concusio cerebri	1			3	1	1		6									
Congelatio					2		3	3									
Contusio	47	18	53	59	77	66	31	351									
Fractura	11	5	6	5	1	12	2	62									
Hernia	3	1	6	1	1	7	4	27									
Luxatio	7		6	4	4	18		39									
Stremma	41	16	27	47	40	29	27	228									
Submersio	4	4				2	1	6									
Venenatio			5	1	1			6									
Vulnus contusum	27	15	26	46	27	30	15	187									
Vulnus incisum	26	4	14	21	15	17	14	111									
Vulnus laceratum	15	1	4	13	1	26	5	75									
Vulnus punctum	6	2	3	17	5	10	3	46									
Vulnus sclopetarium					1	1	1	1									
Vulnus venenatum	2			2	1	1		6									
Poison			1					1									
Malingering								1									
Total	1,127	15	361	7	1,006	3	1,042	4	1,536	10	1,135	7	503	1	18	6,873	53

CLASS V.....

CLASS VI.....

Order I.....

No. 10.—BUREAU OF CONSTRUCTION AND REPAIR.

NAVY DEPARTMENT,
BUREAU OF CONSTRUCTION AND REPAIR,

October 24, 1879.

SIR: In conformity with your instructions, I have the honor to submit herewith statements showing the work of the bureau for the past year, and estimates of expenditures for the year ending June 30, 1881.

1878.			
July 1.	Amount appropriated by Congress for the fiscal year 1878-'79.	\$1,500,000 00	
	Expended from July 1, 1878, to June 30, 1879,		
	for materials, &c.....	\$150,312 49	
	Labor at navy-yards	1,329,970 00	
			1,480,282 49
	Balance on hand July 1, 1879, under Construction and Repair.....		19,717,51
1878.		For timber.	For sundries.
June 14.	Amount appropriated by Congress to meet a deficiency on account of the fiscal year 1876-'77.	\$416,319 32	\$931,134 55
	Expended:		
	From June 15, '78, to June 30, '78.	\$261,801 09	
	From July 1, '78, to June 30, '79...	101,394 96	
			363,196 05
	From June 15, '78, to June 30, '78.	\$673,885 86	
	From July 1, '78, to June 30, '79...	50,424 92	
			724,310 78
	Balance on hand July 1, 1879.....	53,123 27	206,823 77

Vessels on which work in repairing or completion was done during the fiscal year 1878-'79.

Colorado.	Tuscarora.	Montauk.
Franklin.	Vandalia.	Nahant.
Minnesota.	Wachusett.	Passaic.
Wabash.	Wyoming.	Saugus.
Alaska.	Yantic.	Wyandotte.
Antietam.	Tallapoosa.	Alarm.
Canandaigua.	New Hampshire.	Catalpa.
Lancaster.	Constellation.	Cohasset.
Lackawanna.	Constitution.	Emerald.
Plymouth.	Independence.	Fortune.
Powhatan.	Dale.	Jean Sands.
Pensacola.	Jamestown.	Leyden.
Richmond.	Portsmouth.	Mahopac.
Shenandoah.	Saratoga.	Mayflower.
Tennessee.	Saint Louis.	Monterey.
Ticonderoga.	Guard.	Pilgrim.
Alert.	Ajax.	Pinta.
Enterprise.	Canonicus.	Rescue.
Galena.	Camanche.	Rose.
Iroquois.	Catskill.	Snowdrop.
Juniata.	Jason.	Speedwell.
Kearsarge.	Lehigh.	Standish.
Marion.	Manhattan.	Triana.
Nipsic.	Miantonomoh.	Amphitrite.
Quinnebang.	Mouadnock.	Terror.
Swatara.		

The bureau has been employed in the past, as in the preceding year, in repairing such of our ships as were most needed and the appropriation would admit of. We are still pursuing this course, and before the close of the next fiscal year the vessels comprising our squadrons will be in as

an efficient condition as they are capable of being made. Some of the ships built or rebuilt within the last six years, such as the Trenton, Quinnebaug and class, Adams and class, have proved to be fast sailers and good sea boats, and are spoken of by their commanding officers, after full trial, in the highest terms.

Lacking authority, as well as money, to build new vessels, none have been commenced since those authorized by act of Congress approved March 3, 1873. We have, therefore, not kept pace with other maritime powers in the construction of vessels of war, and, with the exception of the vessels above alluded to, our Navy is composed, to a large extent, of ships of a by-gone age; and it is hoped the day is not far distant when the necessity of having a modern navy will be recognized, and that appropriations will be made to enable us at least to commence the building of ships of modern type. Some of the plans of vessels called for by the bureau on the 16th day of February, 1878, have been forwarded; others are still in the hands of the constructors; and as there is no appropriation to commence building, the plans have not been called in, as it is the desire of the bureau to afford opportunity to all constructors to avail themselves of new devices which may occur to them from time to time or be suggested by the experience of other nations.

It is desirable to finish without delay the double-turreted monitors Terror, Puritan, Amphitrite, and Monadnock, and to build new turrets and pilot-house for the Miantonomoh. Work on the latter vessel is now being pushed forward rapidly, and it is expected she will be ready to receive her turrets and pilot-house in a few months. In addition to this work, we should finish the ships New York and Mohican; the former is in frame in the Brooklyn navy-yard, and the latter in the same condition at Mare Island. To finish the monitors and cruising-ships as above indicated, during the next fiscal year, will require an appropriation of \$3,121,876.

To purchase the requisite material, and keep in repair vessels worth repairing, some of which are now in commission, will require an appropriation of \$1,500,000, and that amount has been estimated for in the accompanying tables.

While it is probable that many of our ships to be built hereafter will be of iron or steel, many others will be built of wood. The greatest drawback to the building of wooden ships is now, as it has ever been in the past, the rapid decay of the material used in their construction. Various methods have been tried to preserve wood material from decay, but the devices used have been successful so far to a very limited extent, and, although all promised well in the beginning, experience has not borne out the expectations of the inventors. The end sought, however, is of such importance that it cannot be lost sight of, and it is believed that the method of the American Wood Preserving Company, known as the Thilmany process, now in use in the Boston navy-yard, will prove to be better than any preceding it; therefore it is that, to a limited extent, we are preparing by this process some of the material we now have on hand. Such as we are now preserving will be used almost exclusively in repairs, and we shall the sooner be able to arrive at a conclusion as to its merits. Lapse of time only can determine whether this process is superior to all others, and, therefore, until a sufficient time has elapsed to prove beyond a doubt that it will do all the inventor claims for it, it is not advisable to adopt the system permanently or purchase the apparatus.

The subject of the ventilation of our ships has received much attention within the last two years, and, with a view to making all the im-

provements possible, larger air-ports and additional side and pipe ventilators have in some cases been introduced; the most successful plan for thorough ventilation yet tried is that introduced in the Richmond. As this plan, however, is expensive, and occupies much valuable room, a modification of it is sought for; and in the plans and estimates now being made for its introduction in the Lancaster and Brooklyn, it is believed that both cost and space can be reduced.

Acting under a law approved March 3, 1879, and in obedience to your order of March 17, 1879, Naval Constructor Fernald and Assistant Naval Constructor Hoover were appointed to examine the naval reservations in Florida, to ascertain whether they were of any value to the Navy. As the work was necessarily commenced late in the season, it has only been partially completed. All that part of the State lying west of Tallahassee has been examined and all found valueless for naval purposes, except sections 3, 4, 8, 9, and 10, in township 3 north, range 27 west, and sections 9 and 10, in township 3 south, and range 29 west, as per report forwarded under date of June 4, 1879.

There have been no additions to the corps of naval constructors for over four years, and in order that the corps may be kept in an efficient condition, I respectfully recommend the appointment of four assistant naval constructors, to be selected after a competitive examination. Naval constructors heretofore have been selected generally from those who have had to depend entirely upon themselves for the attainments necessary to fit them for their profession. As members of some other branches of the service are from youth under the fostering care of the government, it would seem that the education of men theoretically and practically for the exceedingly important business of designing, building, and fitting our ships should receive the attention which its importance demands. This want can probably best be met by the establishment of a school of naval architecture. And I respectfully ask attention to the plan which I had the honor to suggest in my report of October, 1877.

Respectfully submitted,

J. W. EASBY,

Chief of Bureau.

Hon. R. W. THOMPSON,
Secretary of the Navy.

*Estimates of appropriations required for the service of the fiscal year ending June 30, 1881,
by the Bureau of Construction and Repair.*

Detailed objects of expenditure, and explanations.	Estimated amount which will be required for each detailed object of expenditure.	Amount appropriated for the current fiscal year ending June 30, 1880.
SALARIES.		
Chief clerk, per act of June 21, 1879 (pamph. ed., p. 36)	\$1,800 00	
Draughtsman, per act of June 21, 1879 (pamph. ed., p. 36)	1,800 00	
One clerk of class four, per act of June 21, 1879 (pamph. ed., p. 36)	1,800 00	
One clerk of class three, per act of June 21, 1879 (pamph. ed., p. 36)	1,600 00	
One clerk of class two, per act of June 21, 1879 (pamph. ed., p. 36)	1,400 00	
One clerk of class one, per act of June 21, 1879 (pamph. ed., p. 36)	1,200 00	
One assistant messenger, per act of June 21, 1879 (pamph. ed., p. 36)	720 00	
One laborer, per act of June 21, 1879 (pamph. ed., p. 36)	660 00	
	10,980 00	\$10,980 00
CONTINGENT.		
For stationery, &c., per act of June 21, 1879 (pamph. ed., p. 36)	400 00	400 00

Estimates of appropriations required for the service of the fiscal year ending June 30, 1881, &c.—Continued.

Detailed objects of expenditure, and explanations.	Estimated amount which will be required for each detailed object of expenditure.	Amount appropriated for the current fiscal year ending June 30, 1880.
CONSTRUCTION AND REPAIR OF VESSELS.		
Preservation of vessels on the stocks and in ordinary; purchase of materials and stores of all kinds; labor in navy-yards and on foreign stations; preservation of material; purchase of tools; wear, tear, and repair of vessels afloat, and for general care and protection of the Navy in the line of construction and repair; incidental expenses, namely, advertising and foreign postage	\$1,500,000 00	\$1,500,000 00
CIVIL ESTABLISHMENT.		
At the navy-yard, Kittery, Me.:		
One clerk to naval constructor	1,400 00	
One clerk of storehouses	1,300 00	
One writer	1,017 25	
Two writers	1,878 00	
	5,595 25	
At the navy-yard, Boston, Mass.:		
One clerk to naval constructor	1,400 00	
One clerk of storehouses	1,300 00	
One writer	1,017 25	
Two writers	1,878 00	
	5,595 25	
At the navy-yard, Brooklyn, N. Y.:		
One clerk to naval constructor	1,400 00	
One clerk of storehouses	1,300 00	
One writer	1,017 25	
Two writers	1,878 00	
	5,595 25	
At the navy-yard, League Island, Pa.:		
One clerk to naval constructor	1,400 00	
One clerk of storehouses	1,300 00	
One writer	1,017 25	
Two writers	1,878 00	
	5,595 25	
At the navy-yard, Washington, D. C.:		
One clerk to naval constructor	1,400 00	
One clerk of storehouses	1,300 00	
One writer	1,017 25	
Two writers	1,878 00	
	5,595 25	
At the navy-yard, Norfolk, Va.:		
One clerk to naval constructor	1,400 00	
One clerk of storehouses	1,300 00	
One writer	1,017 25	
Two writers	1,878 00	
	5,595 25	
At the navy-yard, Pensacola, Fla.:		
One writer	939 00	
At the navy-yard, Mare Island, Cal.:		
One clerk to naval constructor	1,400 00	
One clerk of storehouses	1,300 00	
One writer	1,017 25	
Two writers	1,878 00	
	5,595 25	
Total		40,105 75

No. 11.—MARINE CORPS.

HEADQUARTERS MARINE CORPS,
COMMANDANT'S OFFICE,
Washington, D. C., October 18, 1879.

SIR: I have the honor to submit my annual report for the past year. On the 30th September, 1879, there were 1,979 enlisted men in the Marine Corps, of whom 975 are on board ships in commission, and 1,004 at the several shore-stations.

I renew my recommendation of two years past for an increase in the number of privates.

Having recently returned from a tour of inspection, I am happy to state that I found the officers and enlisted men at the different posts well instructed, and presenting a very creditable military appearance.

Repairs are being made at Portsmouth, N. H.; Boston, Mass.; Brooklyn, N. Y.; and Mare Island, Cal., barracks, which will make them more comfortable.

At League Island the Antietam has been altered into very commodious quarters for the enlisted men, and will answer all purposes for the present. Much credit is due to the naval constructor at that station (Mr. Philip Hichborn) for the excellent plans prepared by him, and the energy with which he has pushed the work on the ship to prepare her in time.

No improvements have been made at Norfolk, Va., or at the navy-yard, Washington, D. C., for lack of appropriations.

At Annapolis, Md., the Wyandank, long used for guard and mess purposes, has sunk. The men have been transferred to a shed on the wharf, no other place being available.

No quarters have been built for officers anywhere, no appropriation having been made.

In the course of the present year the number of officers will probably be reduced to that allowed by law. I renew my recommendation of last year in reference to future appointments, and in view of the importance of the subject to the best interests of the Corps, trust that the Department will make the proper recommendation to Congress.

The system of instruction in rifle firing lately issued to the Army has also been adopted in the Marine Corps, and the rapid improvement already made by officers and men is very satisfactory.

During the past year new arms of caliber 45, have been issued to the troops, and the old ones withdrawn as fast as possible.

The annual estimates, in duplicate, were forwarded to the Department on the 25th September last.

Very respectfully, your obedient servant,

Hon. R. W. THOMPSON,
Secretary of the Navy.

C. G. McCAWLEY,
Colonel Commandant.

UNITED STATES MARINE CORPS,
QUARTERMASTER'S OFFICE,
Washington, D. C., August 14, 1879.

SIR: Having, in obedience to orders, visited the stations at Norfolk, Va.; Portsmouth, N. H.; Boston, Mass.; Brooklyn, N. Y.; League Island, Pa.; and Annapolis, Md., beg leave to report as follows:

The barracks at Norfolk, Va., are in good condition, and will require only the usual annual attention to keep them so.

At Portsmouth the general appearance of the barracks is very good, but the flooring of the men's quarters, guard-room, and some of the window-frames and sashes need repairs, and the walks leading from the parade-ground to the barracks should be paved with hard brick. The coal-house should be enlarged, and the straw-shed needs considerable repairs if it is to continue a permanent building.

At Boston the barracks and quarters for officers would be improved by being painted inside and out. The steps leading from the navy-yard to front of commanding officer's quarters on Chelsea street should be replaced, the wooden stairs leading to the cellar in men's quarters repaired, and the brick pavements connected with the entire barracks should be relaid. The parade-ground, from the effects of heavy rains, is gradually washing away, and if it could be concreted it would be a decided improvement. The skylight in the court-yard needs repairs, and its frame-work strengthening.

The barracks at Brooklyn presents nearly the same appearance it did last year, but the entire building inside and out (with the exception probably of the part used as a hospital) needs special attention, and nothing but a general overhauling and the expenditure of several thousand dollars can put it in proper condition.

At League Island, as you are aware, the men are still quartered on board the Dictator, but that ship is not well suited for quartering so many men.

In regard to quarters at the navy-yard, Washington, I repeat, as last year, that they are entirely too confined for the usual strength of the command at that post, and they should be repaired upon a plan that would much enlarge them.

At Annapolis I found the Wyandank, aboard which the men messed and the cooking was done, had the night before sunk so as to have several feet of water in her hold. That circumstance, I was informed, had been reported to the department, and recently authority has been given for material required for flooring and replacing rooms to be used as kitchen, mess, and guard-room in place of the Wyandank. The building on the wharf, used as quarters for the command, was in good condition, and will require only the usual attention to repairs.

I am, respectfully, your obedient servant,

W. B. SLACK,

Quartermaster Marine Corps.

Col. CHAS. G. MCCAWLEY,

Commandant United States Marine Corps, Washington, D. C.

UNITED STATES MARINE CORPS,
QUARTERMASTER'S OFFICE,
Washington, D. C., September 17, 1879.

SIR: I respectfully transmit herewith the annual estimates of appropriations required for the service of the fiscal year ending June 30, 1881, by the quartermaster's department of the Marine Corps.

These estimates vary from those of fiscal year ending June 30, 1881, as follows:

Provisions, decreased.....	\$7,227 00
Clothing, increased.....	1,835 50
Fuel, decreased.....	1,173 50
Military stores, increased.....	8,140 00
Repair of barracks, decreased.....	2,000 00

The aggregate amount of these estimates is \$425 less than that asked in estimates of last year.

Under "military stores," \$7,500 for the purchase of Springfield rifles, caliber 45; \$1,000 for purchase of ammunition, and \$500 for purchase and repair of instruments for band, and purchase of music, making a total of \$9,000, is estimated for.

The aggregate amount asked for fiscal year ending 30th June, 1880, is \$215,556.50, being \$10,362.50 more than the amount appropriated for the current fiscal year.

I am, very respectfully, your obedient servant,

W. B. SLACK,

Quartermaster Marine Corps.

Col. CHAS. G. MCCAWLEY,

Commandant United States Marine Corps, Headquarters.

Estimates of appropriations required for the service of the fiscal year ending June 30, 1881, by the Quartermaster's Department United States Marine Corps.

Detailed objects of expenditure, and explanations.	Estimated amount which will be required for each detailed object of expenditure.	Total amount to be appropriated under each head of appropriation.	Amount appropriated for the current fiscal year ending June 30, 1880.
PROVISIONS.			
1,000 non-commissioned officers, musicians, privates, and washerwomen, 365 days, at one ration per day, is 365,000 rations, at 18 cents per ration, is	\$65,700 00		
Difference between the cost of rations at 18 cents and commutation at 75 cents for ten enlisted men employed as clerks, messengers, laborers, and orderlies in commandant's, adjutant's and inspector's, paymaster's, quartermaster's and assistant quartermaster's offices, for 365 days, being 3,650 rations, at 57 cents per ration, is	2,080 50	\$67,780 50	\$75,007 50
CLOTHING.			
2,000 non-commissioned officers, musicians, and privates, at \$33.25 per annum, actual cost per contract 1879-'80	66 500 00		
Four hundred overcoats, at \$7.69½ each	3,079 50	69,579 50	60,000 00
FUEL.			
3,894 cords of wood as follows: one colonel commandant, one colonel, two lieutenant-colonels, four majors, three staff majors, two staff-captains, twelve captains, fifteen first lieutenants, fifteen second lieutenants, one thousand non-commissioned officers, musicians, privates, and washerwomen; six hospitals, one armory, five mess-rooms for officers, sixteen offices for commandant and staff, and commanding officers of posts, nine rooms for officers of the day, nine guard-rooms at barracks and navy-yards, three stores for clothing and other supplies; one-fourth additional on 2,400 cords, quantity supposed to be required in latitude north 36 degrees, from 1st September to 30th April, 600 cords, amounting in all to 3,894 cords, at \$4.75 per cord, is		18,496 50	20,000 00
MILITARY STORES.			
Pay of one chief armorer, at \$3 per day, \$939, three mechanics, at \$2.50 each per day, \$2,347.50, in all	3,826 50		
Purchase of military equipments, such as cartridge-boxes, bayonet-scarbards, haversacks, canteens, musket-slugs, swords, drums, fifes, bugles, flags, &c	5,000 00		
Purchase of 100 Springfield rifles, caliber .45, at \$15 each	1,500 00		
Purchase of ammunition	1,000 00		
Purchase and repair of instruments for band, and purchase of music	500 00	11,826 50	9,626 50

Estimates of appropriations required for the service of the fiscal year, &c.—Continued.

Detailed objects of expenditure, and explanations.	Estimated amount which will be required for each detailed object of expenditure.	Total amount to be appropriated under each head of appropriation.	Amount appropriated for the current fiscal year ending June 30, 1880.
TRANSPORTATION AND RECRUITING.			
Transportation of troops and expenses of recruiting.....		\$7,000 00	\$7,000 00
REPAIR OF BARRACKS.			
At Portsmouth, N. H., Boston, Mass., Brooklyn, N. Y., League Island, Pa., Annapolis, Md., Headquarters Washington, D. C., navy-yard, Washington, D. C., Gosport, Va., Mare Island, Cal., and for rent of offices where there are no public buildings.....		10,250 09	13,000 00
FORAGE.			
For three public horses, one for messenger to commandant and staff, Washington, D. C., and two for general use at marine barracks, Mare Island, Cal.....		500 00	500 00
CONTINGENCIES.			
For freight-freightage, toll, cartage, per diem for constant labor, funeral expenses of marines, stationery, telegraphing, apprehension of deserters, oil, gas, candles, repair of gas and water fixtures, water, rent, barrack furniture, furniture for government houses and offices, packing-boxes, wrapping-paper, oil-cloth, crash, rope, twine, carpenters' tools, tools for police purposes, purchase of fire-extinguishers, purchase and repair of hose, repairs to public carryall, purchase and repair of harness, purchase and repair of hand-carts and wheelbarrows, purchase and repair of cooking-stoves, ranges, &c., stoves where there are no grates, gravel, &c., for parade grounds, repair of pumps, and for other purposes		20,000 00	20,000 00

Respectfully submitted.

W. B. SLACK,
Quartermaster Marine Corps.

QUARTERMASTER'S OFFICE, UNITED STATES MARINE CORPS,
Washington, September 17, 1879.

Approved and forwarded:
C. G. McCAWLEY,
Colonel Commandant.

UNITED STATES MARINE CORPS,
QUARTERMASTER'S OFFICE,
Washington, D. C., September 24, 1879.

SIR: I herewith inclose, to be forwarded to the honorable Secretary of the Navy, abstract in duplicate of proposals to furnish rations, fuel, and supplies to the United States Marine Corps, during the fiscal year ending 30th June, 1880.

I am, very respectfully, your obedient servant,

W. B. SLACK,
Quartermaster Marine Corps.

Col. C. G. McCAWLEY,
Commandant United States Marine Corps, Washington, D. C.

Approved and forwarded.

C. G. McCAWLEY,
Colonel Commandant.

Abstract of proposals received for furnishing rations, fuel, and supplies to the United States Marine Corps, under the cognizance of the Quartermaster's Department.

PROPOSALS FOR RATIONS UNDER ADVERTISEMENT DATE APRIL 25, 1879.

Stations.	Bidders.*	Rations per hundred.
Portsmouth, N. H.	Nathan F. Mathes	\$12 48
	Kimberly Brothers	*12 00
	Cyrus L. Brown	12 00
	John C. Gilbert	14 25
	Harry W. Hall	13 09
Charlestown, Mass.	John Mullett	13 09
	Kimberly Brothers	*11 99
	Cyrus L. Brown	14 00
	John C. Gilbert	12 93
	Harry W. Hall	13 50
	Peter Higgins	15 00
Brooklyn, N. Y.	Stephen H. Mills & Co.	14 00
	Kimberly Brothers	*10 74
	John C. Gilbert	14 00
	Harry W. Hall	13 50
League Island, Pa.	Kimberly Brothers	*12 99
	John C. Gilbert	18 00
	Harry W. Hall	14 15
Washington, D. C.	John T. Varnell	12 33
	Kimberly Brothers	*10 24
	John C. Gilbert	14 00
	Harry W. Hall	12 05
Gosport, Va.	W. F. Allen & Co.	13 50
	Kimberly Brothers	*9 99
	John C. Gilbert	18 00
	Harry W. Hall	12 90
Annapolis, Md.	Kimberly Brothers	*10 09
	John C. Gilbert	18 00
	Harry W. Hall	12 35
Mare Island, Cal.	James McInnis	17 24
	Nathan F. Mathes	16 49
	Kimberly Brothers	*14 99
	Harry W. Hall	16 53

* Accepted.

PROPOSALS FOR FUEL UNDER ADVERTISEMENT APRIL 25, 1879.

Stations.	Bidders.	Wood, per cord.	Coal, per ton.
Portsmouth, N. H.	Otis F. Philbrick	*\$5 00	
	E. C. Spinney	5 74	
	William H. Sise		*\$4 39
	Nathan F. Mathes		4 50
	C. E. Walker & Co.		5 00
Charlestown, Mass.	C. A. Campbell	*6 50	*4 83
Brooklyn, N. Y.	B. F. Jayne & Co.	*6 50	*4 60
	Clark & Wilkins	10 00	
League Island, Pa.	James J. Convery	*8 85	6 85
	David Branson	12 00	*6 00
Washington, D. C.	L. W. Guinand	4 43	4 00
	Robert W. Dunn	4 19	4 00
	Johnson Brothers	4 25	3 89
	Z. Williams	*3 96	*3 89
	T. B. Cross, jr.	4 19	4 75
	N. L. Fowler	4 19	4 05
Gosport, Va.	Robert J. Neely	*4 47	*4 73
Annapolis, Md.	John Kealy	*4 75	
	Johnson Brothers	8 00	
	N. L. Fowler	5 95	
Mare Island, Cal.	J. A. McInnis	*7 74	12 99
	Aden Brothers	7 75	15 00
	A. M. Ebbetts		12 74
	A. Powell	7 95	13 75
	James McCudden	9 00	14 50
	George A. Torrence		*11 50

* Accepted.

OFFERS FOR SUPPLIES UNDER ADVERTISEMENT DATE MAY 17, 1879.

Classes.	Bidders.	Amount.
Class No. 1.—Sky-blue kersey, dark-blue coat cloth, scarlet cloth, scarlet flannel.	B. Y. Pippey & Co	*\$12,935 00
	Peter Higgins	14,675 00
	Horstman Bros. & Co	* 1,290 00
	Luke B. French	†11,550 00
	William Mathews	†16,410 00
	Lewis Brothers & Co	†9,300 00
Class No. 2.—Dark-blue flannel, gray blankets, woolen socks.	Wilson & Bradbury	†10,500 00
	B. Y. Pippey & Co	*13,953 75
	Peter Higgins	†15,430 00
	S. M. Heilbrun	*1575 00
	William Mathews	†16,287 50
	Wilson & Bradbury	†4,000 00
Class No. 3.—13-oz. whitelinen, 11-oz. white linen, Canton flannel, cotton ticking,	Francis H. Smith	†9,669 60
	George T. Griffin	†3,700 00
	B. Y. Pippey & Co	*3,175 00
	Peter Higgins	*3,625 00
	Charles W. Hayes	*12,568 75
	William Mathews	3,877 50
Class No. 4.—Full-dress hats, undress caps, fatigue-caps, Berlin gloves, cap-ornaments, storm-caps, cap-covers, devices and shields, white-metal lyres.	Wilson & Bradbury	†2,183 95
	William P. Aston	†1,930 00
	B. Y. Pippey & Co	†762 00
	Edward R. Lyon	*13,510 00
	S. M. Heilbrun	†580 00
	Charles F. Bush	*4,633 80
Class No. 5.—Swords, drums, &c	J. H. Wilson	†3,076 25
	Edward S. Mawson & Son	†987 00
	Charles W. Hayes	†570 00
	Horstman Bros. & Co	*13,810 65
	Wilson & Bradbury	*1741 60
	Edward J. Schoening	†710 00
Class No. 6.—Infantry shoes, arctic shoes	Edward J. Schoening	†108 75
	S. M. Heilbrun	†1,216 25
	J. H. Wilson	†2,047 10
	Horstman Bros. & Co	†774 00
	J. J. Walton	†310 00
	F. W. Maurer	*1,166 30
Class No. 7.—Cartridge-boxes, &c	Paul J. Field	†9 75
	Edward J. Schoening	†876 00
	S. M. Heilbrun	†951 00
	Charles W. Hayes	*1831 00
Class No. 8.—Making and trimming	Richard Levick, Son & Co	†18,760 00
	Hecht Bros. & Co	†2,387 00
	S. M. Heilbrun	*14,901 50
	J. H. Wilson	*13,516 00
	Horstman Bros. & Co	†5,691 00
	Joseph J. Walton	*13,968 00
	Edward J. Schoening	*13,968 00
	B. Y. Pippey & Co	*6,978 24
	Abraham Thorp	7,169 45

* Accepted for part of class.

† Bid for part of class.

‡ Accepted.

W. B. SLACK,
Quartermaster Marine Corps.UNITED STATES MARINE CORPS,
QUARTERMASTER'S OFFICE,
Washington, D. C., September 24, 1879.

HEADQUARTERS MARINE CORPS,
Paymaster's Office, September 25, 1879.

SIR: I respectfully submit herewith estimates for the pay of officers, non-commissioned officers, musicians, privates, and others of the United States Marine Corps, for the fiscal year ending June 30, 1881.

The estimate for transportation of officers has been increased \$3,000, the sum heretofore appropriated for this purpose having been found entirely inadequate to meet the requirements of the service. The amount for commutation of quarters for officers has also been increased \$2,000, made necessary by the increase of this allowance to \$12 per month per room, in lieu of \$10 appropriated for the present fiscal year, authorized by the act approved June 23, 1879. The amount for the pay of officers has been reduced \$7,685, showing a total decrease of \$2,685 below the total amount appropriated for the current fiscal year.

I am, very respectfully, yours, &c.,

GREEN CLAY GOODLOE,
Major and Paymaster Marine Corps.

Col. CHARLES G. McCAWLEY,
Commandant United States Marine Corps, Headquarters.

Approved and forwarded.

C. G. McCAWLEY,
Colonel Commandant.

*Estimates of appropriations required for the service of the fiscal year ending June 30, 1881,
by the paymaster of the United States Marine Corps.*

Detailed objects of expenditure, and explanations.		Estimated amount which will be required for each detailed object of ex- penditure.	Total amount to be appro- priated under each head of appropriation.	Amount appropriated for the current fiscal year ending June 30, 1880.
PAY OF OFFICERS ON THE ACTIVE LIST.				
1 colonel commandant.....	9 Stat. at	\$4,500		
1 colonel.....	L., p. 103, sec. 1, July	4,500		
1 lieutenant-colonel.....	March 3, 1869 (13 Stat. at L., p.	8,000		
1 adjutant and inspector, 1 quartermaster at \$3,500, and	487, sec. 1, July 28, 1866 (14 Stat. at L., p. 337, sec. 37), March 2, 1867			
1 paymaster at \$3,000 per annum.....	(14 Stat. at L., p. 301,	10,000		
4 majors.....	sec. 1), Navy Regulations, July 18, 1816.	14,000		
2 assistant quartermasters, 1 at \$2,800 and 1 at \$2,600		5,400		
per annum.....		47,340		
20 captains, 3 at \$2,520 and 17 at \$2,340 per annum.....		55,500		
30 first lieutenants, 14 at \$1,950, 12 at \$1,600, and 4 at		22,680		
\$1,650 per annum.....			\$171,920	
15 second lieutenants, 12 at \$1,540 and 3 at \$1,400 per				
annum.....				
PAY OF OFFICERS ON THE RETIRED LIST.				
1 brigadier-general.....		4,125		
1 colonel.....		3,375		
1 lieutenant-colonel.....		3,000		
3 majors, 2 at \$2,625 and 1 at \$2,250 per annum.....		7,500		
1 assistant quartermaster.....		2,100		
2 captains, 1 at \$1,620 and 1 at \$1,350 per annum.....		2,970		
2 first lieutenants.....		2,700		
3 second lieutenants, 1 at \$1,155 and 2 at \$1,050 per		3,255		
annum.....			29,025	
PAY OF NON-COMMISSIONED OFFICERS, MUSICIANS, AND PRIVATE.				
1 leader of the band.....		1,080		
1 sergeant-major, 1 quartermaster-sergeant, and 1 drum-		1,080		
major.....		16,200		
50 first sergeants.....		31,560		
140 sergeants, 90 at \$17 and 50 at \$22 per month.....		35,400		
180 corporals, 130 at \$15 and 50 at \$20.....		9,996		
30 musicians, 7 at \$40, 8 at \$26, and 15 at \$23 per month.		17,736		
96 drummers and fifers.....		276,000		
1,500 privates, 600 at \$13, 500 at \$16, and 400 at \$18 per			389,052	
month.....				
PAY OF CIVIL FORCE.				
10 clerks and 2 messengers.....		15,715	15,715	
PAYMENTS FOR CLOTHING UNDRAWN.				
Payments to discharged soldiers for clothing undrawn.....		20,000	20,000	
TRANSPORTATION.				
Transportation of officers traveling under orders with-		8,000	8,000	
out troops.....				
COMMUTATION FOR QUARTERS.				
Commutation of quarters for officers where there are		12,000	12,000	
no public buildings.....				
			645,712	\$648,397

GREEN CLAY GOODLOE,
Major and Paymaster, Marine Corps.

HEADQUARTERS MARINE CORPS,
Paymaster's Office, September 25, 1879.

Approved and forwarded:
C. G. McCawley,
Colonel Commandant.

No. 12.—SURVEY OF THE AMAZON.

REPORT OF COMMANDER THOMAS O. SELFRIDGE.

UNITED STATES SHIP ENTERPRISE (3d rate),
August 1, 1879.

SIR: I have the honor to submit the following report of the surveys of the Amazon and the Madeira Rivers by the United States ship Enterprise, under my command.

The Empire of Brazil includes an area variously estimated from 2,500,000 to 4,000,000 square miles, probably nearly one-half of the whole continent of South America. Lying almost wholly in the tropics, the great watershed of the Andes passes through its territories, giving it the most perfect water system of any country in the world.

Thus it would seem that nature has prepared a way for the opening up of this vast country by the most inexpensive of all systems of transportation, but in the development of which, up to the present time, little progress has been made.

The headwaters of the Parana River, flowing south on its western boundary, almost meets the Madeira, which empties to the north into the Amazon. The latter, flowing nearly east, embraces with its great tributaries the Xingu, Tapajoz, Madeira, and Negro Rivers, a belt of territory comprised within twenty degrees of longitude and fifteen degrees of latitude, and over a million square miles can be reached by this great stream and its arteries. The larger part of this vast area is an unknown country, and shielded within its limits rove tribes of wild Indians, who, taught by the experience of the past, shun all communication with the whites. From what the few explorers have gleaned and the records left by the early missionaries, the greater portion of this country south of the Amazon is a magnificent table-land, abounding in pampas, which could support countless herds of cattle, covered with splendid forests of the choicest woods and most valuable drugs.

The coast range of Brazil, Sierra Borborema, running north and south at an average distance of 300 miles from the Atlantic Ocean, is the limit of the present portion of the empire devoted to agriculture, excepting narrow strips along the margin of the Amazon and Parana Rivers. Between this range and the Andes lies this great territory, watered by innumerable rivers, which finally mingle their streams with the mighty Amazon. But a barrier in the form of a range of hills extends from the boundaries of Peru to the Atlantic coast range, and breaks up the navigation of the four principal southern branches of the Amazon, viz, the Tocantins, Xingu, Tapajos, and Madeira Rivers, into most formidable rapids or cachuelas. These are formed only 250 miles from the mouth of the Tocantins, and about 500 miles up the Madeira. But for such obstacles, the introduction of steam in 1853 on the Amazon would have brought us into closer communication with these rivers. * * *

Steam was first introduced on the Amazon in 1853, and at once new life seemed to be given to the country. It was something compared with the growth of the past, but soon reaching a limit, because dependent upon the productions of the forest gathered by a scattered population, with no inducements for emigration.

The population of Brazil is confined in a great measure to the coast, and engaged in the cultivation of coffee and sugar. The Paraguayan war was a great drain upon its resources, and the expense of which has had to be met by severe taxation. The general government collects its

dates upon all imports, as well as an export tax. Besides, every province supports itself not by internal taxation, but by imports levied upon all its imports and exports. * * *

The country bordering on the Amazon, as well as the lower portion of its tributaries, being subject to overflow, is not healthy, and the soil is light and sandy. It will grow plantains and mandioca, but has not sufficient depth or richness for the more exhausting crops of sugar, coffee, and tobacco.

No nation is more directly interested in the prosperity of Brazil than ourselves. Our geographical situation brings us nearer than Europe, and her coffee, sugar, and raw products of the forest we need in exchange for the manufactures and food we can furnish to her agricultural population. * * *

RIVER AMAZON.

The portion of this great river which flows through Brazil is that with which this report is particularly connected.

From Tabatinga, the frontier post or town of Peru, to the Atlantic, it flows in all its majesty for 2,000 miles, receiving as its great tributaries from the south, the Xingu, Tapajos, Madeira, Purus, and Javary Rivers, and from the north, the Negro. In its whole course it drains but two provinces of the Empire of Brazil, those of Grão Para and Amazonas—the former embracing 532,000 square miles, the latter 550,000, or a total area twenty times that of the State of New York. It is sparsely inhabited, Grão Para not numbering over 120,000 and Amazonas about 30,000 inhabitants, by the census of 1875, these figures including every one but Indians, or about one inhabitant for every 72 square miles. Up to the introduction of steam on the Amazon, in 1854, communication was not frequent between Para and the province of Amazonas, and was confined to a few small sailing-vessels, which consumed about six months in the voyage.

Steam, however, brought about a great improvement, for since 1867 the exports have doubled; but they are still insignificant, considering the territory represented, as the following table, giving the exports from Manaos for the year 1878, and from Soopa, the other port of entry of the province, will show: There are at present two large companies that control the steam navigation of the Amazon River and its tributaries. The Steam Navigation Company of the Amazon, limited, who have enjoyed up to the present a subsidy of about \$500,000 a year from the government. This company are also in receipt of a tax of 3 per cent. upon all the exports from the province of Amazonas, in return for which they promised to make Manaos the capital of the province, the point of departure of all their steamers, and make there a change of freights to the regular line going to Para. * * * This company have the steamers Marajo, Beleue, Manaos, and Avary, all paddle-wheel vessels, built in England, from 250 to 400 tons; and thirteen smaller vessels, ranging from 80 to 150 tons. There is also the Steam Company of Marajo, which have the steamers Anon and Arapixy, with three smaller ones. There are also the Camunan, Tocantius, Villa Bella, and a few others. These steamers nearly all make a central station at Manaos, though a few of the smaller ones are confined to the Tocantius and Lower Amazon. The voyage to Manaos, 874 miles distant from the sea, is made in from five to seven days. From the latter point these lines branch out to include the Madeira, Purus, and Negro Rivers, and to Tabatinga, 1,000 miles distant on the frontier, and from this point up the Peruvian Amazon to

the mouth of the Huallaga, 415 miles, thence up the latter to Turimaguas, 65 miles, in the district of the same name.

Different locations embrace very different products. The india-rubber is brought almost solely from the Madeira and Purus Rivers, and from the Lower Amazon, on the left bank of the Macapa branch and Island of Marajo.

The Rio Negro exports the finest woods and drugs, while sarsaparilla and vanilla are brought principally from the Upper Amazon.

Some coffee and tobacco were formerly raised in Amazonas, but their culture has been neglected for the more profitable gathering of rubber. Cocoa is confined to the settled, older portion of the Amazon, and is principally cultivated below the Madeira.

Steamers burn wood entirely, and wood-yards are scattered along the river-banks wherever one is liable to come. It is sold by the one thousand sticks at \$15 a thousand, which is equal to about \$5 per cord. I found no difficulty in burning wood under the boiler of the *Enterprise*, provided it was dry, and in fact used nothing else during the last month we were on the river.

In 1867 Brazil declared the Amazon open to the commerce of the world. But there is not much inducement to take advantage of this liberality, for the present steam tonnage is too large for a profitable business; and so far from being an opening to the flags of foreign nations, it is my opinion that some of the present force will have to be withdrawn unless the railway project around the falls of the Madeira proves a success.

The cargoes up the river are imported through Para, and consist of breadstuffs, liquors, cotton, paint, cutlery, clothes, and small articles of foreign manufacture, such as trinkets, perfumery, and the like. Return cargoes are principally rubber, Brazil nuts, cocoa, and dried fish, to which are to be added in small quantities sarsaparilla, oil of copaiba, Peruvian bark, vanilla beans, hides, deer-skins, tallow, white pitch, bees-wax, cloves, coir, hard woods, and cedar.

I estimate at present the total exports of the Amazon to amount to not far from \$3,000,000 annually. Of this amount dried fish, the staple article of food for the poorer classes, of a value not less than \$200,000, does not go out of the country.

Though generally known under the sole name of Amazon, this magnificent river, at least twice the size of any other in the world in volume, not excepting the Mississippi, is locally divided into three parts under different names. The Amazon proper extends to its juncture with the Negro, near Manaos, the capital of Amazonas, 874 miles from the sea. From this point to the Peruvian frontier at Tabatinga, 1,000 miles away, it is known as the Solimocus and in Peru as the Marañon. Either of its two large tributaries in Peru, the Ucayali or the Huallaga might lay claim in size to be the parent river, but at Nauta the junction of the Ucayali and Marañon Rivers, it becomes then immeasurably and incomparably the peer of all others. As far as the junction of the Rio Negro it is navigable for a line-of-battle ship at all seasons of the year. There is, however, one point about 10 miles below the Negro where a ledge of rocks extends across, on which it is said there is found but 18 feet of water at extreme low water, but I doubt the accuracy of it, for at the time I passed over this spot there was a depth of 36 feet.

It is high water in the Amazon proper about the middle of May, though the river falls but a little before the middle of July. The temperature of the river water during July and August, above Marituba Island, was found to be 83° Fah.; below, 84° with no change during the

twenty-four hours. Eighteen feet is about the difference between high and low water at the mouth of the Madeira, while at Tabatinga it is as high as 30 feet. This takes place in October after which a rise in the Upper Amazon brings about a fluctuation, there being a rise and fall between that period and January, when the spring rise commences, which culminates in June.

The dry season begins the 1st of June, earlier than at Para, where it rains more or less all the year around. This is the season of the breezes, and the trade wind from E. S. E. blows strong during the day as far up as Obidos, dying out calm at night. During August and September, there are violent squalls with lightning and thunder from the eastward.

The rainy season commences in November, and continues through the winter and early spring months, but during this period the rains are far from being continuous, but interspersed with a great deal of fine weather. The thermometer ranges between 78° Fah. in the wet, and 88° in the dry, season. The nights are not oppressively warm, but are rendered disagreeable at all times by swarms of mosquitoes. There is no relief from these pestiferous insects even in the middle of the river, for the sun is no sooner down than the air becomes alive with them.

There has been a great difference in the reports of the altitudes of the different points on the Amazon. Probably none have had a standard at the ocean level, and as the diurnal fluctuation would represent several hundred feet of altitude without a base of reference for barometrical observations, they cannot but be inaccurate.

Our observations represent the difference between the height of the barometer at the point of observation and one at Para, to the recording of which I am greatly indebted to Mr. Andrew Cahn, United States consul, who considerably allowed it to be hung in his house and volunteered to take charge of the readings.

We found the elevation of the Amazon, at the mouth of the Madeira, to be 78.5 feet; and at Manaos, 84.8 feet. The distance between these two points being 86 miles, would give a rise a little less than an inch to the mile; and this is about the rate for all points from the sea to the mouth of the Rio Negro, as obtained by our observations.

The towns or villages on the Amazon, so far from flourishing, appear to be in a state of decay, judging from the empty houses on the outskirts, neglected streets, and entire absence of all enterprise or business life. Manaos, the capital of the province of Amazonas, is, however, a marked exception, it being the distributing point for all the territory above. Its inhabitants are enterprising and the indications are that it is growing fast. Above Para we have as the principal villages Breves, Garupa, Prainha, Monte Alegre Santarem, Obidos, Villa Bella, Serpa, and Manaos. The use of steam has been detrimental to these towns in scattering their population, for formerly the products were brought to the neighboring villages in canoes and traded off for stores. Now there are hundreds of little trading-points where steamers stop, delivering goods direct from Para and receiving the freights collected, no matter in how small quantities. It is to this cause, rather than a diminution of population or decrease in the productions, that the impoverished condition of these towns is owing.

The current of the Amazon varies from 3 to 2½ miles per hour, according as it varies in width. The banks are alluvial, and during high water the surrounding country is inundated.

For the first 500 miles from the ocean there is but little irregularity of direction, and there are reaches of 10 and 15 miles in length, giving the appearance of an inland sea.

Above the mouth of the Tapajos the Amazon assumes a winding course, but even here it is more from a comparison with the lower portion and from the fact that large islands are more frequent, which give the channel greater irregularity. The general width is about $2\frac{1}{2}$ miles, narrowing to a mile at Obidos and Serpa, and expanding to 4 and 5 miles above and below the Tapajos. It is not only in its width but in its astonishing depth and consequent volume that the Amazon exceeds all other rivers in the world. Not less than 60 feet will be found in the channel the whole distance of 874 miles to the mouth of the Rio Negro. At Serpa and Obidos, where it narrows to a mile in width, 330 feet is obtained in the center of the stream.

The cross-section at Serpa was very favorable to an approximate calculation of volume; as the river was straight, the banks steep on both sides, and the surface current uniform. It was taken in August, when the river was 6 feet below high water, and gave the astonishing amount of 3,850,000 cubic feet per second.

The Amazon divides just above the junction of the Xingu, 200 miles from the ocean, into two great branches, known as the Macapa and the Garupa, each of which is as large as the Mississippi, and the latter, near the town of the same name, separates again into two others, Garupa proper and the Vicira (Shell).

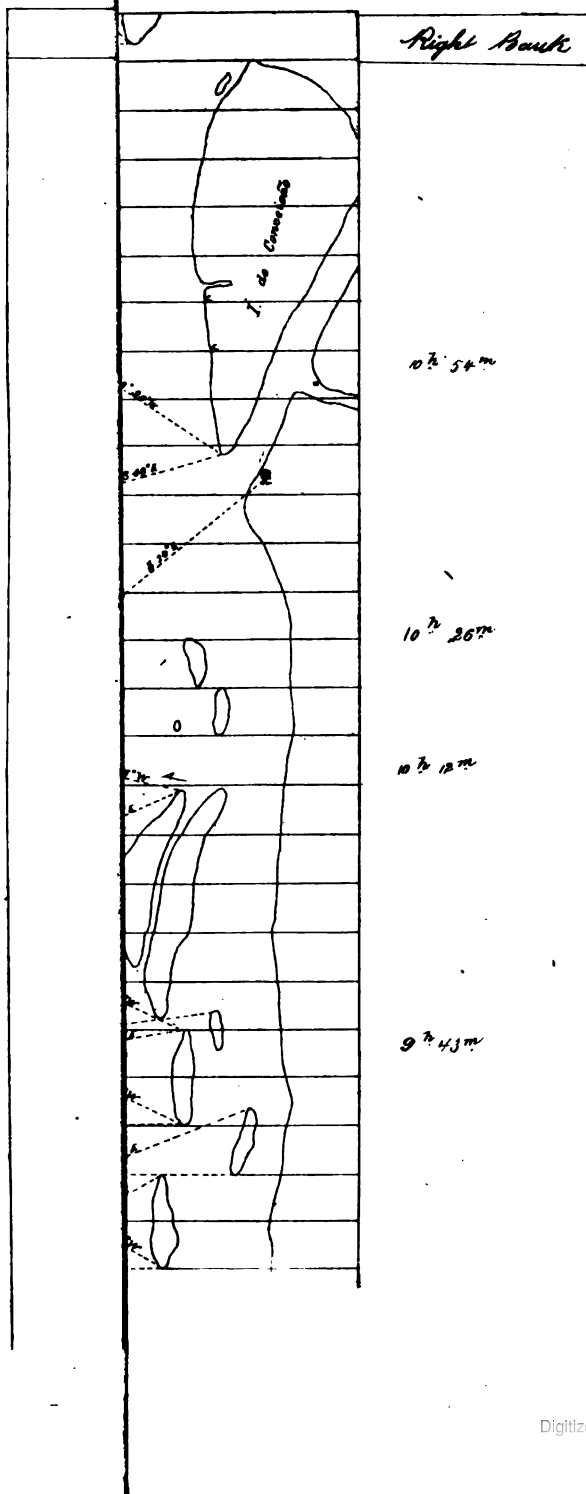
Most geographers give the mouth of the Amazon as 180 miles wide, which would include Marajo Bay, really an arm of the sea, in which the Para River empties. I am, however, of a different opinion; for though Marajo Bay is connected with the Amazon by a series of lagoons and estuaries, their characteristics show that they have no connection proper with it. The water is comparatively clear, but of a moderate depth, and the tide flows within a few miles of this outlet from the Amazon. The majestic, ceaseless flow of this great river is something striking, which effect is lost the moment you enter the intricate channels back of the island of Marajo. Its dimensions are sufficiently grand without attempting to include the net-work of lagoons that are now the communication between Para and the Amazon, and I think the Delta may be justly said to extend from Cape North, at the northern point, to Cape Maguary, on Marajo Island, as the southern limit.

THE SURVEY.

Your orders to me to take charge of the survey of the Amazon and Madeira rivers to the head of navigation on the latter, and assigning me to the command of the United States Steamer Enterprise for the purpose, were received April 23, 1878. Beyond the necessity of a few extra instruments in excess of the ship's allowance but little preparation was necessary, and I sailed from Norfolk, Va., on May 2, 1878. In addition to the officers of this ship, Mr. Sparrow, civil engineer, who had been engaged some years previous on a survey of the Upper Amazon, with Commodore Tucker, was detailed as my assistant.

We arrived off Atalia point at noon of May 23, where we anchored, waiting for a pilot to come on board next morning. The entrance to the mouth of Marajo Bay, or river Para, is rendered dangerous by numerous reefs, and, though the main channel is marked by a light-vessel, the light is too feeble to make it advisable for strangers to run for it on account of the variable currents caused by the outflow of the Amazon.

Atalia Point, 20 miles south, marked by a light, may be approached at all times with safety, using the lead, and here will be found pilots for the Para River. We anchored off Para on May 24. Visits were exchanged



Right Bank

10 1/2 54m

10 1/2 26m

10 1/2 12m

9 1/2 4.3m





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with the President of the province of Grão Para, who offered every facility as far as Obidos, the boundary of the province.

MODE OF SURVEY.

My instructions from the Bureau of Navigation contemplated a track survey of the Amazon to the mouth of the Madeira, and up the latter to its falls or the head of navigation. These instructions directed that the courses of the ship should be steered by ranges, and a blank form was furnished called a "deck board" to be filled out with the courses, distance run on it, speed of ship, rate of current, and column for remarks. As the bureau properly remarked, the survey was to ascertain more the navigability of these rivers rather than an accurate delineation of their beds. Consequently the course of the main channel, the depth, the position of the bars and islands, and particularly the point of crossing from one bank to the other, together with the correct topography of the banks, were the main objects in view.

From our very commencement it became evident that running on ranges would not be practicable. The banks are fringed, it might be said, the entire distance with trees and undergrowth. Some tall tree could be selected, but this would be but a point, and before the course was run over it would become blended with others so as no longer to be recognizable. Strictly, a compass course would not do, for this would be constantly deflected by the current. The method of observing the bearing some point ahead was adopted, and this bearing became a course. When the ship had arrived abreast of it another course was taken, and so on. Instead of the "deck board," I adopted, with some modification, the system I used for the survey of the Atrato, and which was found by experience to fully answer all requirements, and I would recommend it to any one engaged on similar service.

For a clear exemplification I will refer to the accompanying diagram. It will become evident in the course of this explanation that its success would depend upon the accuracy of two cardinal points—correct measurement of speed of vessel, and correct astronomical determination of our position at the end of our work. To maintain the first the engines were not pushed, so that a regular speed of 35 revolutions was easily maintained ascending the Madeira against the current. Going down the Amazon this was reduced to 25 revolutions. The log was hove every half-hour as a check upon the speed, and current observations were made before starting and after coming to. As our line was mainly in the channel, the current was much more uniform than if we had run on line crossing the stream. For a perfect astronomical determination of our position at the end of each day, observations for latitude were made on stars at meridian passage, one north and the other south of the zenith; and for longitude, on stars east and west of the meridian at as nearly the same altitude as possible. Summer's method was used where circumstances prevented the observation for meridian stars. The latitudes were computed using circum-meridian method given in "Professional papers Corps of Engineers, U. S. N., No. 12," and longitudes by the ordinary time-sight (Bowditch).

Observations for rate were made at Para on our arrival, Araras Island, Madeira River, where an interval of fourteen days was obtained. Also at Serpa, Amazon River, on the 16th of June and 2d of August, an interval of forty-seven days. This latter gave a most excellent check upon our chronometer rates, which were found to run very uniformly.

On our return the error of chronometer was carefully obtained at Para on the 31st of August and 2d of September.

The position of Para was taken from the French chart, and may be subject to slight error; if so, the error would be applied as a constant to all our positions, and would not in any way affect the general result.

A tabulated list of these observations accompanying this report, and, on inspection, the results of the two observations will be found to agree closely, while the mean was taken as a final result.

Lieut. Commander S. H. Baker used a Gambey sextant No. 74; Lieut. C. P. Perkins, a Gambey circle of reflection No. 21. A wooden tripod, said to be originally the invention of Passed Assistant Paymaster Tuttle, late United States Navy, was used by both observers, Mr. Perkins having made some ingenious modification to suit the use of his circle of reflection. This tripod, standing about 2 feet high, consisted of its three legs secured with brass hinges to a flat piece of wood of about 4 inches across. In the center of the latter was a socket, in which turned an upright wooden spindle in two parts, hinged together in its center, thus admitting of vertical and horizontal motion for the sextant attached to it. A hole bored through the handle of the sextant, in which a screw was inserted, secured the instrument to the spindle with a button. In this way the sextant resembled an ordinary vertical circle. With the instrument once on the reflected star in the mercury, it was not necessary to move it until the object observed had passed out of the field, and there was time enough generally to take a set of five or more observations. Without some arrangement of this nature, stellar observations with a sextant are very fatiguing; but with the sextant stationary, as above described, there can be obtained an accuracy of observations almost perfect.

The accompanying diagram is a copy of a leaf taken from the field-book in the survey of the upper part of the Amazon, a little below Villa Bella, and an explanation of which will plainly show the method of our survey. The unit is five minutes, which is the value of each one of the lines. The work always commences at the bottom and proceeds upwards. On the left hand are columns for day of month, time, course, magnetic variations and deviation combined, true course distance by log, current, true distance, and soundings. The right page is the field-book, a line drawn in the center representing the course of the ship.

It will be observed that the time of the lower line is nine hours twenty minutes, at which time a new course east or south 89° east true was taken. This is marked by a star on the right leaf; and every change of course is so marked. As the survey was progressing down the river, the left hand is the left bank, and the reverse. At nine hours and twenty minutes a bearing on the point of the island is taken south; at 9.25 another bearing is taken of the same point south 50° west, which fixes it, and another bearing south 27° east is taken of the other point. Now at 9.40 a new course is steered north 81° east true, showing that from nine hours and twenty minutes to nine hours and forty minutes twenty minutes have been run on the course south 89° east. As the time distance is that by log plus rate of current, or in this case eight knots, each five minutes will represent sixty-six one-hundredths of a knot. The draughtsman, in plotting, will lay off a course south 89° east, distance two and sixty-four one-hundredths knots. At the point of commencement he lays down the bearing south, then a distance sixty-six one-hundredths of a knot is laid off and at this point the two bearings south 50° west and south 27° east are taken to plot the point of island.

For another example, take the time ten hours and twenty minutes

The star on the center line of right-hand page indicates a new course; we find it to be from the left page north 67° east true. We find at ten hours twenty-six minutes a bearing south 70° east was taken upon a prominent tree, and again at 10.54 a bearing south $23^{\circ} 30'$ west was taken, with the point of Isle de Conceicao and the tree in range. The draughtsman then, after laying down the course north 67° east for a distance of 3.28 miles, will lay off on this line points corresponding to the distances run during the time from the commencement of the course to the time of taking the bearings. From these points the several bearings will be drawn.

Unless the system of keeping the courses in a straight line in the field-book were pursued, the course would frequently run off the page, and would require a vast amount of measuring to keep the notes clear.

I think these two examples are sufficient for an explanation of the system followed. The contours of the banks are sketched in as we arrive opposite them, always taking as many bearings of the same points as necessary to fix it. This will give the distance of the river banks from the ship and the general width of the river. At times bearings were taken between the five-minutes spaces, in which cases times were recorded. For instance, at nine hours forty-three minutes a bearing south 18° east, on the course of north 81° east, as this course was begun at nine hours forty minutes, the value of the distance run for three minutes, laid off from its commencement, will indicate the point to lay off the bearing. On each side of the right-hand page are columns for remarks on each bank. For instance, at Corzalinho there were rocks, and the estimated distance was 3.5 miles. With the Madeira it was not difficult to obtain a very correct width of the river by bearings of points on the different banks, because of its numerous bends, and the fact that it rarely exceeded half a mile in width. But on the Amazon, with its long straight reaches of many miles, and intervening islands, this method was not always possible.

In our survey of the Amazon, the steam-launch ran a separate line on the side opposite to the ship. Every twenty minutes a position-flag was hoisted, at which moment the bearing of the launch was recorded, and the angle of our mast-head was taken. This gave the distance between the two, and to this would be added the distance of the bank from each observer, which was generally small, and could be estimated within 100 yards.

These positions of the launch, thus obtained, when plotted, acted as so many offsets to check her survey, which necessarily could not be as accurate as ours, on account of being obliged to use a dumb compass. Every morning or evening, as convenient, the bearing and distance of the point of astronomical position was taken, which marked the termination of the day's work and commencement of the new.

The value of such a survey as described depends upon the accuracy of the points fixed and the correctness of distance run, and, feeling alive to these facts, every safeguard was taken to insure them.

Of course a running survey of this kind would not do where close work is needed, but for all practical purposes, for the survey of a river that is annually undergoing important changes, in order to obtain a thorough knowledge of its navigability, distances, position of islands, and general contour, it is all that is required.

In addition, the points of all islands where shoal water would be found were sounded in the launch, and two daily cross-sections were taken.

For the better accomplishment of our survey the officers were assigned to different duties.

Lieut. Commander S. H. Baker and Lieut. C. P. Perkins were selected, on account of their experience in astronomical work, for the very important duty of fixing the several points of the survey. This required their constant attention every evening until near midnight, and the following day would be mostly consumed in bringing up their work. These officers performed the work assigned them with zeal and ability.

To Ensigns Hunt and Peacock was given the duty of keeping the field-book, taking the numerous bearings required, and recording soundings.

Lieutenants Nichols, Blocklinger, Spalding, and Master Wright had charge as officers of the deck, superintending the handling and steering of the ship, and the soundings.

Lieutenant Blocklinger afterwards had charge of the launch in the survey of the Madeira River. Lieutenant Nichols, assisted by Ensign Hunt, had charge of the running survey by the launch, in connection with our own, from the mouth of the Madeira River to Para. To all these officers my thanks are due for the interest they manifested in their work, and for the accuracy and zeal they exhibited in the performance of every duty required of them. Much praise is due to Passed Assistant Surgeon M. L. Ruth for his unremitting attention to his duties, and to which I attribute in a great degree the excellent condition of our ship's company during a very arduous period.

COMMENCEMENT OF WORK.

The few preparations necessary, due to a prolonged absence, having been made, the *Enterprise* sailed from Para at noon of June 30, 1878. In this respect I was greatly indebted to Mr. Fred. Pond, at the head of the old establishment of that name, and the only American house in Para. Mr. Pond is a large-hearted American, noted for his deeds of kindness to any of his countrymen in distress. He gave me every assistance in his power, and in numerous ways facilitated greatly my plans. Such men as Mr. Pond our government would do well to appoint as consuls, for they have an influence for good with the local authorities that a stranger from the United States unacquainted with the language, laws, and customs could be expected to acquire only after a long residence.

The city of Para, or Santa Maria do Belene, is advantageously situated on the Para River, distant about 100 miles from the sea, and about 12 miles from Marajo Bay, a beautiful expanse of water, and of an adequate depth for the convenient working of all classes of vessels. The river in front of the town is shoal, and vessels are obliged to lie in the stream and unload by lighters.

Steamers of the larger class anchor off the port 3 miles below the town known as Forte da Barra. Para occupies to the Amazon the same position relatively that New Orleans does to the Mississippi. It numbers about 30,000 inhabitants; the business portion of the city is well built, with many handsome residences. Its importance being wholly due to the fact that it is the distributing point of the products of the Amazon; its growth has been relative to the development of the latter. In this enterprise the merchants of Para have taken the most important part, and many of them, especially the Portuguese, have amassed large fortunes. To continue the dependence upon them, the merchants here have built up a vast credit system, which holds the whole country as its debtors, but which necessarily renders them at times liable to large losses; for

instance, in the almost total failure of the cocoa crop during the past year, upon which large advances had been made.

Some system of wharfage by which vessels could be discharged more quickly is absolutely necessary, and, doubtless, this will come with other improvements when Brazil awakens to the value of the vast domain drained by the Amazon, and embarks in a wise system of improvement and development.

The *Enterprise* steamed rapidly up Marajo Bay, which in many places is 15 miles wide, as I intended to take what might be called the back passage to the Amazon, which is the only one in use, instead of going outside and entering the mouth proper.

We anchored for the night at the entrance of the estuary of Breves, one of the network of water passages which constitute this back way. This being our first experience, I had a little fright in the grounding of the vessel lest our pilots were incompetent, but fortunately we backed off without difficulty. Just before coming to anchor, the mouth of the Tocantins was passed, the distant shores of which, sinking away in the horizon, gave the appearance of an inland sea, so wide is the river at its entrance. But, like all the other southern tributaries of the Amazon, its navigation is impeded a few hundred miles from its mouth by rapids and cataracts.

The next day was passed proceeding up the estuary of Breves, until at nightfall we reached the little town of the same name, on the western shore of Marajo Island, which is its principal settlement. Rounding to, an accident happened to the reversing gear of the engine, which at this critical moment refused to go back. An anchor was let go, but failed to bring the ship up in time, and the *Enterprise* went at full speed into the bank, the head spars pushing into the thickets of the tropical forest. A whirr was heard as a large bird flew from the thicket and down on the fore-castle, dropped, to the astonishment of "Jack," a nest with little ones. They were too young, unfortunately, or they would gladly have been adopted by those who had so ruthlessly deprived them of their natural protector.

Breves is the center of the rubber trade of this region, but its situation is so low that the malarial fevers have made it unpopular, and it is anything but flourishing at present.

Our man-of-war was almost as much of a surprise as was Columbus's galley to the natives of the new world, for the *Enterprise* was the first ship which had ever anchored off their town.

In the evening a violent thunder-squall passed over the town, struck the ship, and drove her crashing against the bank; but this time it was the stern instead of the bow. The rain fell in torrents, the wind roared through the trees, and the darkness was of that intense blackness that one sees in the solitude of tropical forests. A flash of lightning revealed a long, sinuous-looking object, hanging from a branch over our poop-deck. Snake! was cried, and it was not long before that spot was as deserted as the forest into which we had been pushed. The storm finally passed, and the bank being steep, the current swept us out again into the stream.

In the morning our apparent snake was seen still hanging from the bough where he was first reported, and proved to be the remnant of a large vine that had been broken when the ship struck the bank. It occasioned a good laugh, and was long treasured among the jokes of the expedition.

The river at Breves was 600 feet wide. We were still within the in-

fluence of the tide, which flows as flood for four hours, and then follows eight hours of ebb.

A short distance above Breves we entered a long, narrow passage, hardly wide enough for the ship. These narrow lagoons are known as *furos*. There are two leading up from Breves, the *Paracachi*, which is used in ascending to the Amazon, and the *Aturia*, in descending. As there is no room to pass in them, any vessel not observing this rule would be subject to heavy fine.

We made the passage of the *furo Paracachi* without accident, though it required the most careful steering, and our yards at times almost touched the trees. At the further end there was a sandspit, which forced us to anchor till the tide, which here rises nearly three feet, was at its full, when we passed over without difficulty.

To those unaccustomed to the luxuriance of the tropics, there was something extremely novel and interesting in the passage of the *Enterprise* up these lagoons, fringed to the water's edge with trees one hundred and thirty feet high, interspersed here and there with numerous members of the palm family, whose long fan-like branches hang down in such graceful attitudes. But the eye wearies at length with the everlasting tree-line that borders the banks of these rivers, and which, in the mighty Amazon, are so blended together that they lose the attractiveness due to the variety of growth that the narrowness of these "*furos*" permits the eye to dwell upon. I was strongly reminded of my sojournings of previous years upon the *Atrato*, which has pretty much the same flora, and I looked forward with eagerness to our approach to the great Amazon. Another day yet elapsed before we reached the point where the Amazon bifurcates into its two branches, the *Macopa* and *Garupa*, and it was late at night before we anchored at this point.

I shall never forget the feelings that this mighty river inspired as in the morning we rounded the point where we had anchored, and came out upon the open river rolling down in all its resistless majesty. Four miles broad at this point, stretching out to the westward until it was lost in the dim outline of the distant horizon, it seemed hardly possible that this was a river almost dividing a continent.

Can it be possible, the mind asks the question, that nature reproduces herself year after year, and carries back from the ocean, borne in the clouds overhead, the vapors that, condensed, yield a supply sufficient for the feeding of this tremendous flow of water, amounting to many millions of cubic feet a minute?

Our ship was kept close to the southern bank to avoid the strength of the current, and we thus had the full flow of the river to our right as we ascended. In the distance to the north the blue Almerine hills made a pleasant background to this picture of nature's grandeur, particularly enjoyable, because it was rare on the Amazon to have any break to the forest-girt banks.

A good idea of the width of the Amazon is shown in the fact that at this point we took a series of compass deviations by steaming around in a circle and observing the runs upon each point of the compass.

In the afternoon of the day we entered the Amazon, June 7, 1878, we stopped to speak a schooner that was towing down the river. Upon starting ahead a crash was heard in the engine-room, accompanied by an escape of steam up the hatch. As soon as the excitement had subsided it was found that the connecting-rod bolts of the after-engine had broken short off, which let the end of the rod down into the well, and the crank, in making a revolution, had struck and badly bent it.

This accident filled me with apprehension, for the success of the ex-

pedition was entirely dependent upon the motive-power of the Enterprise.

Far away from the mouth of the Madeira, with no means of reaching there outside of ourselves, at first I was inclined to feel disheartened, but a second thought that we could move along slowly at first with one engine was reassuring.

The accident was caused by water in the cylinder, which the relief valves failed to carry off. To straighten so large a piece of machinery as our rod was no slight undertaking. But it is an unfortunate state of affairs when the stores of a man-of-war will not furnish expedients to repair. Accordingly our little forge was taken forward and placed in the fore hatch, a hearth of bricks built around it, so as to enlarge its area, and the rod hung in chains over it from the carlines of the topgal-lant fore-castle deck; a moderate heat was applied, and a hydraulic jack operating from the deck overhead, by slow stages, brought it to nearly its original form, sufficiently so, that, practically, it was not fore-shortened. It was found, too, that the connecting-rod bolts could be shifted end for end. All this required several days, but in the meanwhile the engines had been disconnected, and the ship proceeded up the river at a rate of almost five knots an hour, the condenser being temporarily changed from a surface to a jet condenser by applying a stream from the donkey-pumps. This gave a poor vacuum at first, but afterwards, at the suggestion of Assistant Engineer Shewell, the flow from the donkey-pumps was divided in two streams or jets with a most marked improvement, being able to maintain a vacuum of sixteen inches.

After making the required repairs we proceeded ahead very well with both engines for twenty-four hours, when, attempting to take up some of the lost motion of the after engine, the safety limit was passed and, with another crash, the connecting-rod bolts gave way, letting it down into the engine well.

We were now in a worse plight than before, and it seemed as though circumstances would combine to deprive us of our motive-power. It was both dangerous and awkward to work the ship with a single engine, as it was liable at a critical moment to get on the center, and the assistant engineers are entitled to great credit for the skill with which this single engine was manipulated. The expedient of turning the bolts was no longer available, and new bolts must be supplied. It was fortunately found that the transporting-axle of our large pivot-gun was the exact size, 3 inches. Four bolts were accordingly cut from it, and threads at each end of the bolts worked in by hand. Every one knows how difficult this must be, for the smallest inaccuracy would prevent the thread from entering the groove. That we did it, however, was owing only to the skill and faithfulness of one of our machinists, James Moore, assisted by another of the name of Chambers.

I do not hesitate to pay this compliment to Moore, that to him, under the circumstances, though humble his station, I am indebted more than to any other person of this ship. So far no notice has been taken of his services by either the then chief engineer, Elijah Laws, or the Bureau of Steam Engineering, and I think that such meritorious conduct is entitled to some recognition from the Navy Department.

The slow progress of the ship upstream and the rapid falling of the Madeira River, made it essential that I should so far modify my plans as to commence our work on that river, and proceed with the Amazon afterwards.

We arrived off the mouth of the Madeira at 4 p. m. on June 17, hav-

ing been fourteen days making a distance of 800 miles, and at once commenced the survey of that river.

Our survey of the Madeira River, of which a detailed account is given in the latter half of this report, ended by our return to its mouth on the 24th of July.

The next day was spent in measuring a base line of 400 feet on the north end of Madeira Island, and fixing by triangulation the east and west points of the Madeira, the east and west points of Trinidad Island, as well as Antuz Point, on the Amazon. The north end of the base line was fixed by stellar observations.

Left our coal lighter at anchor at the Madeira in charge of its crew of two Tapinjos Indians, and, getting under way at 4 o'clock p. m., steamed all night up the Amazon, carrying not less than 10 fathoms of water.

July 26.—Approaching the river Negro, a curious phenomenon presents itself. The general course of the banks of the Amazon seems to connect with those of the Negro, as though they were of the same river, while the Amazon, turning off suddenly to the south, and shrinking temporarily very much in size, seems to have lost its majestic proportions and yielded the palm of greatness to its tributary, the Negro. The color of the water of the latter is nearly black, and does not mingle completely with the Amazon for several miles. So sharply are the waters of the two rivers defined, that a vessel crossing their line will be found with its bow in black water and the stern in yellow. The Negro, from its junction with the Amazon, opens rapidly into a river of such proportions as might be considered a bay rather than a river, some 4 miles wide and 12 long.

On this bay is situated the town of Manoa by far the largest on the Amazon, and indeed the largest city in Central South America. It is very picturesquely placed, on a series of low hills skirting the bay. The houses, mostly of one story, are neatly constructed, plastered, with the sides either painted or covered with painted tiles. It is as regularly laid out as the nature of the ground will admit, and the principal streets well paved and lighted.

Manoa contains probably 6,000 people, and is the capital of the province of Amazonas, which has a population of about 100,000, of all classes. It is the residence of the president of the province, and is the port through which passes all the trade of the rivers, Purus, Negro, and Solimões, and its tributaries, as the Amazon is termed above its junction with the Negro. The Brazilians keep a small naval flotilla here, consisting of a side-wheel gunboat, and three large steam launches, mounting a howitzer, the whole commanded by an officer of the rank of captain de fregate. It is the principal terminus for the steamers of the Amazonas Navigation Company, and from whence they depart for all the numerous tributaries of the Amazon.

Manoa from its situation should become a town of importance. But started with capital from Para, the latter has retained in it its grasp, and until the merchants of Manoa can succeed in freeing themselves from its rival, it will continue to be as it is now, only a feeder for the older and more opulent city. The cathedral occupying a commanding situation in the center of the town, is a fine edifice, as it indeed ought to be, if the time and money spent on it are criterions, as it is said to have been fifteen years building, and to have cost a half million dollars. There is a pleasing absence of the tinsel and tawdry coverings for the numerous saints common to Catholic churches in foreign countries, and the altar and frieze of the choir is a very handsome structure of cut stone brought from Portugal.

Amazon River, July 31, 1878.—Got underway from Manoa at 8.30 a. m. The river off Manoa is very deep; 500 yards from the shore is found 45 fathoms, and this ship anchored abreast the cathedral, 300 yards from the shore, in 23 fathoms. We passed the junction of the Negro and Amazon at 9.30 a. m. The water of the former is found on the north shore for 4 miles below its mouth, before it is entirely mingled with the Amazon. At about 8 miles below the junction of the Negro and Amazon, abreast the west point of the island of Morodo, and extending in a line across the river to the north shore, is a reef of rocks, whose exact position is unknown, and makes this the most dangerous point in the navigation of the Amazon from its mouth, when the river is low, during October and November. The channel runs about 400 yards from the south bank, and had at this time 7 fathoms. Allowing a fall of 3 fathoms more would give 4 fathoms at extreme low water. Passing slowly down the river, steaming 4 knots with a 3 knot current, at 2 p. m. came to in 8 fathoms at the upper end of island Eva. High land along the north shore the whole distance from the Rio Negro to anchorage. South shore low. Light easterly breezes during the day which died out at sunset; calm during the night, some mosquitoes.

August 1.—Underway at 7 a. m. Attempted to work with one pair of boilers, but found it did not give sufficient steam reserve, and, therefore, started two more. Current fully 3 miles per hour; speed, 4 knots. At 1 p. m., off west end of Trinidad Island. Took on board 2,000 sticks of wood from a house on left bank, just below Trinidad. Then proceeded back to old anchorage off the mouth of the Madeira. Some bluffs 70 feet high on north bank; south bank low. The alluvial bank of the Amazon now about 10 feet out of water. Light breeze from eastward set in at 7 a. m., and died out to perfect calm at sunset. Night very close and hot; swarms of mosquitoes. Hoisted out steam-launch and prepared her for service in connection with our survey.

August 2.—At 7 a. m., got under way from Madeira taking our coal-lighter alongside, and bid it a final farewell. Both banks of the Amazon from the mouth of the Madeira to below Santarem are lined with cocoa plantations, which are generally planted on a narrow strip back from the river, not three hundred feet wide. At all the plantations that I visited the trees seemed very old, and, from what I could learn, they date back as far as the Portuguese. The crop is an uncertain one, and I should judge not very profitable.

A cocoa or cocoa plantation is an exceedingly pretty sight; the trees interlock their branches, and with their large leaves make a shade impenetrable to any ray of the sun. The ground is level, covered with a carpeting of dead leaves, and the large golden-colored fruit hanging by themselves from branch and trunk show through the green with a most beautiful effect.

There are two harvests—one in January and February, the other, and largest, in June and July. The fruit somewhat resembles a large over-ripe cucumber; when gathered the shell or pod is broken open and the seeds spread on raised platforms to dry. They have to be frequently turned, and in about a week are ready for the market. The seed is planted in garden-beds in August. When the plants come up they must be carefully protected by arbors of palms from the sun, as well as preserved against insects.

In January the plants are transplanted to their permanent place, where they are set out in squares of 4 feet apart. Indian corn or plantains are planted between the rows to give them protection against

the sun while young, which are grubbed up as soon as they commence to press against the trees.

The launch in charge of Lieutenant Nichols, with Ensign Hunt, left at the same time as the ship, for a survey of the rocks on the south side of Trinidad Island, and survey of the south shore, while this ship run the north bank and channel. Arrived off Serpa at noon. Found 45 fathoms in middle of river off the town. The river was so deep on the south shore and rocks lining the Serpa side that I tied the ship up to the south bank, with 8 fathoms close to.

Serpa is a town of some consequence, as the custom-house for provincial exports from the Madeira is located here for the collection of dues from produce that does not pass through the port of Manoas. It has a population of about 700 people, and the district of Serpa will number near 2,000 persons. There is but a small export trade of rubber, cocoa, and dried fish. Mr. Stone, an American, resides here, owning a cattle ranch a short distance below the town. He is an intelligent man, and much information on the affairs of the country may be obtained from him. Currents, 3 knots per hour.

The volume of the Amazon at this point, as calculated from our cross-section allowing a current of $2\frac{1}{2}$ miles per hour, amounted to 3,858,000 cubic feet per second.

August 3.—Passed down to the south of the long island of Serpa. The steam-launch in the parana of the north bank. Beautiful weather; light, pleasant breeze from eastward. Current, 3 knots, which may be regarded as the general average rate of the Amazon. Came to at 2 p. m., off the Furo Resaca, on the south bank, in 12 fathoms. The Furo Resaca is a long igarapé, which connects with the Furo Cannman, affording navigation with the Maderia or as far as the Tapajoz at Santarem. The steam-launch ran a cross-section and found the width of the river at this point 3 nautical miles.

Sunday, August 4.—Remained at anchor.

August 5.—Sent the large iron lighter in tow of the steam-launch to the shore for wood. Took on board 1,700 sticks. Passed down the river as far as the island of Friexal, at the head of which we came to in 10 fathoms. Found the current to-day about $2\frac{1}{2}$ knots. The banks from the Furo Resaca to the island Friexal are low on both sides, and but very sparsely inhabited. On the north bank, opposite the anchorage, there are high hills which bound an igarapé, which comes into the Amazon again at the eastern end of the island of Serpa. The volume of the Amazon, measured at this point gave 4,094,396 cubic feet per second.

August 6.—Made 30 miles by river and anchored at 1 p. m., at the mouth of the Parana Pacoral, which is used by all steamers, up and down, in preference to the main river, which is much longer. Came to with stream-anchor, and on account of defective link, and also partly because anchor was let go before ship was headed upstream, the chain parted at 60 fathoms. Let go port-bower anchor. The buoy attached to stream-anchor refused to watch, and though we spent one day in dragging for the anchor, did not succeed in picking it up. The nights are much more sultry as we pass down, and mosquitoes are very numerous and troublesome.

August 7.—Got under way at noon, and passed down the right bank in main stream. The river along the islands of Pacoral and Onces is very wide, and a broad plain makes out from these islands. Arrived off Villa Bella at 5:30 p. m., and anchored in mid river in 12 fathoms of water. The Brazilian chart gives too much water in cross-section opposite the town. The pilot reported rocks off the town of Villa Bella.

Sent steam-launch in to sound, but could not find less than 10 fathoms close to bank. The volume of the Amazon, as calculated from our cross-section, gave, at this point, 3,899,149 cubic feet per second.

August 8.—Visited Villa Bella for a short while this morning. It is located on a bluff about 60 feet above the river. Marks on banks indicate a fall of about 5 feet thus far in the Amazon. The town presents rather an imposing appearance from the river, with its long row of one-story white houses. But on going ashore one finds the whole village consisting of the single front street, the suburbs being confined to half a dozen mud huts. The town owes its chief importance to being the point of export and import for the Ramos or Carmanan, which extends for 150 miles, and connects with the river Madeira, 60 miles from its mouth. On this inland river is situated the town of Manheés settlement of the Mandirwea Indians, noted principally for its manufacture of the much-sought-for guarana. The land bordering on the Ramos is spoken of as being of more than ordinary fertility. Considerable quantities of cocoa are also exported from Villa Bella; as also dried pirarum and a little rubber. The population of the town is about 400, and of the district 5,000. Came to at 1 p. m. at the head of the islands Caldeiros. The river forms two channels at the head of these islands, and while there is good anchorage, it must be approached with caution from the south shore, as there is but 3 fathoms quite a distance from the island, which would only give a few feet in low water. A short distance above the Caldeiros Islands are the Sierras Pauntin, the boundary line between the provinces of Para and Amazonas. They are remarkable for rising directly up and a very steep slope from the river bank, to a height of 500 feet. It is the only instance of high hills jutting abruptly into the river from its mouth to Manoa. These sierras are heavily wooded from their base to summit. Fresh breezes from the E.N.E. till 2 p. m., then a perfect calm. Night very hot and sultry.

August 9.—Got under way at 7 a. m. Sent launch down the north side of the Caldeiros. Fresh breezes from N.E. from 7 a. m., and considerable sea on the river. Spoke a steamer at noon bound up the Purus, which reported that the delayed steamer Rio de Janeiro had arrived six days behind time at Para, which will assure our getting a mail upon reaching there. Sent the steam-launch around inside the island Macaraassu; found quite a large village known as Juruty. Anchored off Santa Ana at 1.30 p. m. Though there is good anchorage, care must be taken in approaching from across the river, as there is nearly a dry bar with only 6 feet, not more than 300 yards inside of 12 fathoms. Pulled up little river of same name for some distance, and found it wide enough for the gig to pass easily. Cocoals of cocoa lined the banks, and I was informed it took a canoe a day to reach the head of the creek, upon which were many houses. Cattle may be obtained here from the padrone. During our stay at Santa Ana, on our passage up, the little settlement was engaged in a "festal" in honor of the christening of the few babies that had been born during the year. Had a great many mosquitoes, but a light breeze from the eastward tempered the air, and made it less close than previous evening.

August 10.—The steam-launch left at 6.15 a. m., to pass around the north of the island Bon-Jardin, while we got under way later, and passed down on the south side, which is the one principally used. The river from Bon Jardin to Obidos runs nearly straight, in an easterly direction. Arrived off Obidos at 2 p. m. The water is very deep close aboard the town, there being 45 fathoms 100 yards from the shore, and a strong eddy or counter-current at this distance off. Came in slowly

to within 100 feet of the beach, and anchored abreast of, and at the foot of, the bluff, upon which the fort is located, and a little west of the water-battery, in 13 fathoms. Got a line out immediately from the port bow to the shore, and also one from the port quarter. Ship laid very quietly, stern to the westward, head downstream, with the sternpost just touching in soft, muddy bottom.

Obidos is a scattering town of about 500 inhabitants, skirting the river and extending back half a mile. The bluffs upon which it is located measured by my aneroid gave 80 feet for the lower, then rising to 160 feet, upon which is a small chapel dedicated to Our Savior, from the portico of which there is a fine view up and down the river.

Obidos, from the many unoccupied and ruined houses, would not appear to be in a flourishing condition. It seems to be affected with the same apathy as one sees in all interior towns of South America; only enough labor is undertaken as will furnish the bare necessities of life. It is the last town on the Amazon within the limits of the province of Grao Para. It is the only fortified position on the river, there being a battery of eight 32-pounder guns on the bluffs which, however, could be passed without difficulty at night. This is the extreme point, 537 miles from the sea, at which the tide makes itself felt, there being a fluctuation of a couple of inches.

The district, which extends back indefinitely and up and down on both sides of the Amazon, contains about 15,000 inhabitants. There is considerable trade in cattle, the rolling country affording good pasturage, and all the Upper Amazon received its supplies of beef from this place. The banks of the Amazon are in this vicinity generally taken up with cocoals, and Obidos, in good years, will ship 30,000 arrobas of cocoa, also some 500,000 pounds of castawhas or Brazil nuts, and some oil of copaiba. The river at this point is but 2,200 yards wide, and has in the middle 55 fathoms, the greatest depth we have yet found in the Amazon.

August 11.—Passed a quiet Sunday at anchor; a good many persons visited the ship in the afternoon.

August 12.—Got under way at 7 a. m., and stood down south bank; launch going to the north of islands. Anchored at 2 p. m. off a place called Lago Grande, the proprietor of which was engaged in the manufacture of tiles.

August 13.—Under way at 8 a. m., and met the launch around by the island Marinarituba. At the end of this island the Amazon makes a sharp turn to the south, and at the angle of the bend comes in the long parana. Abreast of the island Paranatoba there is a large praia, which our pilot, not knowing the channel, attempted to cross; soundings continued to decrease to 3 fathoms, when we anchored; sent out a boat to sound, and found that the channel, with 6½ fathoms, ran down along the south bank. Got under way at 1 p. m., and stood over to the south side. Arrived off the mouth of the Tapajoz at 4 p. m. The water of this river is clear, and the sandy bottom imparts a greenish tinge to it. Here was presented the same phenomenon as at the mouth of the Negro—the water of the Amazon not mingling with the Tapajoz, a sharp dividing line between the two rivers extends across the mouth of the latter. One mile from the mouth is the town of Santarem, the largest place on the river bank. It is beautifully situated on rising ground, in front of which is a beach of white sand, and the junction of the two rivers gives a large river front which adds much to the situation. The country back of Santarem is hilly, as are also the banks of the Tapajoz, with numerous cattle ranches on the latter. The merit of the discovery of this place

and of the friendly relations that existed between the Portuguese and the Indians is due to Capt. Pedro Texeira, who, in 1626, under superior orders, went up the Amazon in search of Indian slaves, and brought none from Santarem. Forty years afterwards the Jesuits, at the instigation of the local government, founded a mission here. In 1694 a fort was built on a small hillside to the east of what was then the village and called the "Fortress of Tapajoz." It was intended to prevent any outsider from entering the Tapajoz, and to guard against any proposed ascent of the Amazon. Under the protection of the fort many houses were erected, which formed the nucleus of the future city. In 1754 the missionary parish and neighboring village were consolidated, and the title of town given to it by the Government of Para. In 1833 the name of Santarem was changed to Tapajoz, but in 1848 a provincial law restored its former name, and it was made a city. Population of Santarem is about 3,000, and the district 5,000; this was a place of considerable importance with the Portuguese, and, judging from appearances, the ratio of improvement has not been rapid. Borracho from the Tapajoz, some guarana, cocoa, castanha nuts are the principal exports.

Santarem is interesting to Americans as the place where a number of American colonists from the Southern States settled immediately after the war. Most of these became discontented and returned home in the Quinnebaug; but some ten or twelve families remained engaged in the cultivation of the sugar-cane, and I am glad to say they speak encouragingly of their prospects, and are making slow but sure progress ahead. The dry season commences here in July and lasts till November.

August 14.—Through ignorance on the part of the pilot, though anchored in 7 fathoms when the ship swung to the ebb, it grounded aft in $2\frac{1}{2}$ fathoms, the stern tending in shore. The better anchorage is off the south end of Santarem, where the water is not so bold. Off the north end the water is deeper, and a ship must anchor in from 12 to 14 fathoms to keep off the bank when swinging inshore. The action of the tide upon the Amazon produced a regular ebb and flow in the Tapajoz while we were at anchor. This is the more singular as the series of current measurements every hour for twenty-four hours failed to show any difference in its velocity owing to the influence of the ocean tide, which is just felt on the Amazon 600 miles from its mouth. I account for this curious incident of an ebb and flow off Santarem by the fact that the Tapajoz, at this season flowing from the south, and through a drier region, is lower than the main river; while the Amazon at its normal state, uninfluenced by tide, would be higher and would back up the Tapajoz till the difference of level of the latter became equalized to the greater height of the Amazon. This would of itself cause slackwater for a time at the mouth of the Tapajoz. Therefore, when the level of the Amazon is raised still more by the pressure of the inflowing tide, it causes at certain times a backing up of the Tapajoz and results in a slight rising or the same as a flood-tide. Nothing of this ebb or flow is met on the Amazon at this point.

August 16.—Remained at Santarem till to-day, to bring up our survey, which was behind. Took on board a little orphan American girl, Alice Stroope, for passage to the United States. Under way at 10 a. m., and at 3 p. m. anchored off the north shore abreast head of island Barieros. The most dangerous shoal that I have met on the Amazon makes out from the north shore for 500 yards abreast this island, and navigators should give it a wide berth at night. During the day it is marked by a smooth line on the river surface. Upon anchoring, though we approached it at an acute angle, the sounding jumped from 9 fathoms to 1 in a single cast

of the lead, and the ship struck forward heavily, but the bank was so steep that, with the helm hard astarboard and the current, she swung off at once without stopping.

August 17.—Under way at 7 a. m. Launch surveying north shore. At 1 p. m. anchored abreast the Parana Monte Alegre, off and a little below the head of the island Friexal. There is excellent anchorage here in 7 fathoms. Visited during the afternoon in the steam-launch the town of Monte Alegre. This is on a beautiful parana of the Amazon, 5 miles from its mouth. An igarapé connects this parana with the Lago Monte Alegre. It was founded by missionaries of the "Fathers of Piety" early in the seventeenth century on the bank of the river. Afterwards it was moved to the top of the hill, when the Indian village of Gurupatuba became the city. There is first the fort, consisting of 200 people, close to the shore. The mountain road is then ascended to the town. Half-way up is a spring of delicious water running out of the sandstone. The top of the hill is the table-land, containing probably six or seven hundred acres. There is a large plaza, upon which is quite an imposing church for the neighborhood. The houses are arranged round the plaza, and a little off on the slope. The view of the Amazon and surrounding campas, the freshness of the air, the wide grass-grown plaza, all combined to make it the pleasantest scene we have encountered in our Amazon experience. Large numbers of cattle and horses graze on the campas, which, with dried fish, make the principal exports. Here can be purchased the rudely decorated calabashes, known as cujas. The prettiest cujas are found at Monte Alegre and Breres. A cuja is a drinking-cup made from a dried gourd. The rich black ground color is produced by a dye made from the bark of a tree called comaten, the gummy nature of which imparts a fine polish. The yellow tints are obtained from tabatinga clay. The red is made with the seeds of the urnea or anatlé plant, and the blue from the indigo which is planted around the huts.

August 19.—Passed Sunday at anchor off Monte Alegre. Had a severe squall wind, with little rain, at 2 a. m. Got under way at 7 a. m. Buoy foul of the propeller, but fortunately chafed off. Standing down the river steam-launch on south shore. Arrived off Prainha at noon. Pilot said there was good anchorage. Stood in carefully, carrying deep water, within 300 yards of the town, when suddenly shoaled from 15 to 5 fathoms, and immediately to one and one-half; grounded forward, but backed off without difficulty. Stood over to island Uruara in the middle of river. Water very deep close to latter, and anchored alongside of grass in 7 fathoms. Found a fall of tide of at least two and one-half, but current remained of about the same force. Prainha is a small village of about 300 inhabitants, and perhaps 2,500 in the district. It exports some cattle, 200 head a year, and a small amount of cocoas and castanhas.

August 20.—The channel here lies down the north side till the island Acaraassu is reached, when the south bank is followed to the junction of the Gurupa branch. There is a dangerous shoal off foot Itanda Island to look out for coming up stream at night. Anchored at 3 p. m. at the head of Jurupary Island in 8 fathoms, good anchorage. Very strong northeast breeze; ship riding over the anchor. Could not find firm ground at head of island, and observation party had to cross to north bank, and did not return until 2 a. m. From Prainha to the sea, the rise and fall of the tide rapidly increases from about 3 feet to the maximum. When the tide is out it leaves the banks surrounded by soft mud, making them difficult of access.

August 21.—Under way at 7 a. m. The height of Sierra de Intahy in sight all day yesterday and to-day, forming a pleasant change to the

usual background of green; and the sun setting behind them has given very beautiful sunsets. The usual channel extends down the south bank. Ran a cross-section over to the Resqueiro Islands, found 8 fathoms and more across to the islands; found a channel of 8 fathoms in the middle between the two lower Resqueiro Islands by which a ship can pass from south bank to the middle or north bank of the river. Pilot said these were connected by a praia and no passage through. At 1 p. m. came to on south bank, but having 24 fathoms close to it, ran in and tied up to the trees in 5 fathoms, nearly opposite to village of Almerim. Visited the latter in the afternoon. It consists now of but half a dozen houses, but from the ruins it might have been in the time of the Portuguese a place of more consequence. There are the remains of an old fort at the bluff, which an intelligent black man said was built by the Dutch. As the latter nation were driven out of Brazil in 1654, it would make the old ruin over two centuries old.

August 22.—Under way at 7 a. m., standing down on south bank, and anchored at 1 p. m. at junction of main Amazon and the Gurupa Branch. Sent ashore and measured a base line of 1,100 feet for the purpose of establishing neighboring points. High water at 3 p. m.; rise about 5 feet, ship swinging, however, all the while to the ebb. This night, the first one for three, without a heavy wind squall. Light winds during day and night.

August 23.—Established surrounding points from base line, and point on opposite bank. Took all the coal remaining in lighter alongside except three tons for launch. Under way at noon, passing down Gurupa branch of Amazon. Passed mouth of Xingu at 1 p. m. At 4 p. m. came to off and just above the town of Gurupa. Found the Brazilian charts at the junction of the Gurupa and main river very much out. By chart, the village of Gurupa is distant 30 miles from this point, while our run made it but 18. The Brazilian maps indicate rocks off the town. Surveyed it carefully, the river front, and found the navigation perfectly safe within 300 feet of the shore. The Gurupa branch is deep and about $1\frac{1}{2}$ miles broad. The Amazon bifurcates at Point Jariuta, the head of Gurupa Island. This point consists of about 4 feet of alluvium, overlying hard, blue clay, which presents an impassable barrier to the further advance of the Amazon, though it receives and divides the mighty forces of that river. The Gurupa branch divides again opposite the town of Gurupa, into the Gurupa branch proper, and another known as the Vieira or Shell. Set out tide-gauge and found high water August 25 to be at 4 p. m.

August 26.—Anchored Sunday; under way at 6 a. m. Found the extreme rise and fall of tide to be 5 feet. It is within two days of spring tides, so that probably the tide ranges between 4 and 5 feet except during the rainy season. We were anchored on the slack-water side, and the maximum current during the ebb was 2 knots; at the time of high water this was reduced to 1 knot. The town of Gurupa, though picturesquely situated on a rocky bluff 40 feet high, overlooking the river, presents such a dilapidated appearance that it gives the impression that at one time it was much more flourishing than at present. Gurupa was formerly a village called Mariocay, inhabited by savages. The Dutch took this place about 1620, fortified it, and, having made a treaty with the Indians, remained until the Portuguese, having received information of the fact, arrived with a force sufficient to drive them out. In 1623, fearing new assaults, the colonial government fortified Mariocay with a fort, the ruins of which can still be seen to the eastward at the foot of the district. The Carmelites established a mission here in

1674. The San Francisco friars also settled here in 1695, and remained until 1774, when all the friars of this order were sent to Portugal. In fact the advent of steamers has been a blow to the larger villages, as these now touch at all the points where there is any cargo, no matter how little, to give or receive, the result of which is the establishment of a great many petty trading posts, which supply the immediate country and absorb the traffic that used to concentrate in canoes at the towns. The latter, therefore, now only maintain their existence by being the voting centers of the districts, at which will assemble all the male inhabitants of the parish once or twice a year, and celebrated as a gala day.

Agriculture is almost extinct. A small portion of the inhabitants still attempt to raise mandioca, but nearly all this article is imported; no better proof of the laziness of the villagers, for mandioca will grow by itself if the weeds are kept away. The cocoa plantations planted thirty years ago may be said to be abandoned, as only an insignificant part of the fruit is harvested for exportation, together with small quantities of the sarsaparilla, Brazil nuts, and rubber, which is the most important of its scanty exports. The sugar-cane is only cultivated by two of the principal residents, and there are but two cane-boiling establishments and two rum distilleries, the productions of all of which are consumed in the district. While there are more than 10,000 head of cattle in the district, but little attention is paid to breeding. A few are produced in the interior, but the business is not properly conducted, owing in a great degree to the want of proper clearing near the river above the annual overflow.

This description of Gurupa, once a flourishing village, is unfortunately but too common a type of civilization in the Amazon Valley, where nature in its bounty has supplied such abundant stores of fish, plantains, and the actual necessities of life, as to result in a *dolce far niente* lassitude, which envelops the whole country.

Spoke at 7 a. m. steamer Canumen, but was disappointed in not getting any American papers. At 10.30 went alongside of wood-yard, and took on board about 2,500 sticks of wood. Standing down the Vieira (Shell) branch of the Amazon till 2 p. m., when we came to the mouth of the Furo Itaguara, where steamers turn off for Para. The Furo is separated from the Amazon by Vieira Point; off the latter, for 300 yards from it, the water shoals to $3\frac{1}{2}$ and 4 fathoms; outside this 5 fathoms is found to the opposite shore. Just below Vieira Point is the small island Cabocca. There is good anchorage here, as 6 fathoms will be found from bank to bank. The channel runs on either side of the island. Anchored at 2 p. m. Observation party ashore at Vieira Point. Fine night.

August 27.—Under way at 6.30 a. m. Passing during the day through Furos, Itaguara, Lemão, Tayapura. Anchored at 2 p. m. off the north of Furo Parachachi, the narrow passage through which the ship came on the way up. These Furos will average 700 yards, with depth varying from 5 to 15 fathoms. The channel a little toward the concave side. The passage through these narrow channels is the most picturesque on the voyage from Para to Manaos. Vegetation and water meet, the roots constantly wet from the river, and stimulated by the hot sun, exhibit the rankest profusion of tropical growth. Apparently where a vine can find room to cling, it hangs in a graceful luxuriance, broken here and there by the pretty Javary palms. At the close of the dry season the effect is particularly beautiful by the change in color of many of the trees. Looking ahead, one sees luxuriously blended all the shades of

green, red, and brown. Ship swung one hour to flood, showing this point to be the highest at which the tide overcomes the current.

August 29.—Sounded yesterday off the mouth of Parachachi, and found the channel very narrow, with but $3\frac{1}{2}$ fathoms, which would give $4\frac{1}{2}$ fathoms high water. The shoal water is not, however, more than 300 feet wide, with six fathoms on sea-side. Steamers are obliged to ascend the Parachachi Furo and descend the Aturia to the Breres River under the penalty of a heavy fine if disobeyed. Under way at 6.30 a. m., passing down the Tayapura Furo some 6 miles till the mouth of the Aturia Strait was reached. Had 4 fathoms at mouth, then deep water through. It is about 8 miles long and much wider than the Parachachi, as we had no trouble in passing with lighter and steam-launch secured abreast. The Aturia comes into the Breres River some 3 miles below the point where the Parachachi is entered. Passed Breres at 11 a. m. A long praia makes out from south point of the mouth of Breres River well along to the end of Dia Island; care must be taken not to approach within less than five fathoms. Anchored at 3 p. m. off Guajara lights. Squally and cloudy during the first part of night, but the weather cleared sufficiently during middle watch to obtain observations.

August 30.—Under way at 5.30 a. m. High water yesterday evening at 7 p. m., several hours later than at Para. At 9.30, passed the town of Curralinho, which seems to be a larger place than Breres. At 4 p. m., found a wooding station abreast island Xipotuba; stood over to it across the channel and found 6 fathoms to the shore; pilot knew nothing of the state of the channel beyond the beaten track. Took aboard 1,500 sticks and left at 5.30. Passed by the island Janaraca, and anchored after dark, at 6.30 p. m., off the lights Goiabal. There is a very long shoal sand spit makes off the island Janaraca, upon which there is not more than 2 fathoms; also a shoal off Goiabal light. Going up or down without a good pilot, it is well to keep over to north shore, keeping lead going. Going down, do this till 5 fathoms are struck on the Goiabal spit, when stand off at once to southward and westward. Fresh squall of wind at 8 p. m., and heavy rain at 4 a. m.

August 30.—Carried out 5 fathoms from anchorage. Under way at 5.30 a. m., and anchored at 11 a. m., Cotejuba light bearing northeast, distant one mile. Burned wood alone under six boilers and made 45 revolutions—7.2 knots.

August 31.—Dispatched the steam-launch in charge of Lieutenant Nichols, to make a survey of the shoals of Gozabal light, which position we left yesterday. Under way for Para at 11 a. m., half-tide. The pilot got out of the channel and ran the ship aground, but with a rising tide backed off. A good guide for this channel is to head for the light on Cotejuba till the cathedral of Para is opened out, then steer so as to shut in the opening between the two islands, and keep this closed till you head over for the point on the right hand going up. From this point the chart is a good guide, but vessels of the draught of the Enterprise, 18 feet, should not attempt to go up until half-tide. The difference between high water at Breres, nearly the highest point within the influence of flood tide, and Para is about three hours. If steamers would leave the latter on the last of the ebb, they will be able to carry the flood with them nearly the whole way to the former point. This is important to remember, for the ebb runs very strong.

The Enterprise arrived off Para in the afternoon after an absence of three months, having during this period completed a running survey of 1,500 miles.

Santa Maria de Belem, or Para, situated on Para River, 100 miles from

the Atlantic, is the seat of the provincial and Roman Catholic diocesan governments, and the place where the provincial assembly meets. It is the port of all the commerce of the province, and, as the receiver and distributor of the products of the Amazon, has before it a splendid future. It contains many public edifices, banking establishments, various mercantile companies, an excellent naval dock-yard, a college for grown students, and, in addition, several schools, attended by 403 male and 401 female students. In the municipality outside of the city there are twenty-one primary schools, attended by 1,418 scholars. The health of the city, except in times of epidemic, is generally satisfactory. Any climatic disease can be traced to a want of cleanliness. The streets are only cleaned by rains, and when these fail on a number of consecutive days there are places which become unbearable. Para is destined to become, if not already, one of the finest cities in the northern part of the empire, and if the municipal rents, which are estimated to amount to \$100,000 yearly, are properly expended on works of utility and adornment, it will become one of the first cities of Brazil.

Having fully carried out your instructions, we sailed from Para September 4 for New York, where arrived on the 25th of the same month.

MADEIRA RIVER.

This, the greatest tributary of the Amazon, rises in the Andes, in the vicinity of Cochabamba, latitude 18° south, longitude 66° west, and, flowing generally northeast for nearly 2,000 miles, empties into the Amazon in latitude $3^{\circ}22'30''$ south, and longitude $58^{\circ}45'$ west. Though generally known to geographers as the Madeira throughout its whole length, it is really divided into different divisions, and known locally under as many different names. We have first the Lower Madeira from its mouth to its first falls, those of San Antonio; then the falls of the Madeira, eighteen in number, embracing 229 miles of river; then the Upper Madeira to the junction of the Marmoré and Guaporé rivers, a distance of 96 miles. From this point it is only known as the Marmoré River to its source. Thirty-nine miles below the upper fall, known as the Guajará Merim, opposite the fall known as the Cachoeira Madeira (on account of the large quantity of wood found here, brought down by the river Beni), the Madeira receives the river Beni. A cross-section of the Beni, taken by Keller, at its mouth gave a width of 1,000 meters and an average depth of 15 meters. As it discharges at its ordinary stage a volume of 4,344 cubic meters per second, something more than the Marmoré and Guaporé at their junction, it might in justice be considered as the main river, and the two last tributaries, and the name Madeira applied to the river only below the mouth of the Beni.

The exact boundaries of Bolivia and Brazil are a matter of dispute; but, according to the treaty regulations of 1870, the mouth of the Beni was designated as the point where the frontier running due west between the rivers Javary and Madeira touches the shore of the latter; consequently the left shore of the Madeira or Marmoré is Bolivian territory upwards from the mouth of the Beni, while the right belongs to the Brazilian province of Matto-Grosso.

A cursory glance at the map of Bolivia shows that the Madeira and its tributaries drain two-thirds of its arable territories.

Confined to the miserable little port of Cobija, on the Pacific, as its only outlet to the ocean, and separated even from this by a trackless desert and the Sierras of the Andes, it is a matter of wonder that Bolivia has not made greater exertions to improve its natural outlet by the way

of the Madeira. It is not in the province of this report to discuss the subject of the Bolivian water-ways, beyond showing their connection with that part of the river Madeira which it has been my duty to survey and investigate. It is sufficient to remark that the Marmoré is navigable to Viçuña, 150 miles from Cochabamba, on the river Chaparé, a branch of the Marmoré, which flows through what may be called the garden of Bolivia, as far as nature has blessed it with a most fruitful soil and equable climate. But the whole of this inland navigation is, and will be, confined to a few canoe-loads of cinchona or quinia until the means of passing the falls of the Madeira are obtained, which at present present an impassable barrier to the transportation of any but the more valuable of Bolivian products, from the danger and expense attending their passage.

On the 27th of August, 1868, the concession of a canal or railroad around the falls of the Madeira and the right of navigation of the Marmoré and other tributaries were given to the National Bolivian Navigation Company, organized by George E. Church, esq., of New York City. A 6 per cent. loan of £1,700,000, authorized by act of the Bolivian Congress August 28, 1871, was placed in London in aid of the above enterprise. Notwithstanding the necessity of this enterprise for Bolivia, but little has been done towards its fulfillment, and this little gives but small encouragement for the future. Unreliable contractors, the difficulty of procuring laborers, the necessity of bringing supplies the whole way from Para, 1,500 miles distant, have all conspired to make the attempts of the originators of this work result in entire failure.

Mr. Church, however, with characteristic American energy, is still struggling for the success of his pet project with a perseverance that should be crowned with success, and in my opinion will be if he can extricate the undertaking from the slow litigation of British courts, in which the discontented and disappointed bondholders of the Bolivian loan have thrown it.

The engineers of the present contractors, Messrs. Collins Bros., of Philadelphia, have succeeded in demonstrating the practicability of a line which, after the first 10 miles, presents no difficulties for the next 60 miles; and there is every reason to believe that having reached the elevated plateau through which the Madeira has cut its way by a series of cataracts, they will be able for the remaining 120 miles to find a desirable profile.

As I remarked, at present nothing but the valuable and costly Peruvian bark will bear transportation over the falls, and the natural treasures of the Bolivian plains must remain unsought for until these natural barriers have been overcome.

Let America, then, in every way possible, assist the energetic Church in his noble enterprise, for she, of all nations, should reap the greatest benefits from the success of his undertaking.

It is, then, in the navigation of the Lower Madeira from the Falls of San Antonio to its mouth, in view of the probable construction of the Madeira and Marmoré Railroad, that the United States has the most interest, and to this particular portion of the river I have, under your instructions, confined my survey and investigations.

CHARACTERISTICS OF THE LOWER MADEIRA.

By the Lower Madeira will be understood that part of the Madeira between its mouth and the Falls of San Antonio.

In the character of its banks and its numerous islands it resembles the

Mississippi River. In one feature, however, like the Amazon, it is very different. That is, in the number of small lakes that are found on both banks throughout its course, with outlets on the river itself. These lakes embrace a vast network of internal water communication which enables the rubber-hunters to reach with canoes a large area of country that would otherwise be almost unavailable, as they would be compelled to travel long distances by land to reach the numerous rubber trees which are the great source of wealth of the inhabitants.

They abound in large quantities of fish, turtle, and wild fowl, and when the river is high are the homes of numerous alligators. Nearly all these lakes, where the wild Indians have ceased to frequent them, have the little huts of the "seringueiros" on their borders, which thus accounts for the much larger population than is apparent to those who only see the inhabitants on the river bank.

The Lower Madeira, through its whole course, may be said to flow through an alluvium. The only out-cropping I noticed in the first 50 miles was very small, apparently trap, at the foot of a low hill on the left bank at the foot of the island Orucurutuba. Above there is met at rare intervals, at low water, a ferruginous conglomerate underlying a bed of clay. Of such a character is a portion of the left bank abreast of the Uroa rapids. This conglomerate is one of grit stone, little pieces of dolomite cemented with oxide of iron. Its beds are generally horizontal and from four to five yards thick. This ferruginous conglomerate having more resistance than the underlying argillaceous gritstone, the latter crumbles by the action of the water, allowing the conglomerate to topple over into the bed of the river, forming bowlders which, under the general name of "pedras," are the terror of the Madeira steamboatmen.

The occasional irregular resistance of the banks causes the course of the river to become serpentine. Banks of sand are formed on the convex side, and the concave side is gnawed away by the constant action of the water, causing the river to assume an irregular course; then the mighty force of increasing floods will force itself through the isthmus, straightening itself again and cutting off a portion of its bed, which accounts for the numerous lakes spoken of as peculiar to the adjoining territory of the Amazon and Madeira.

This untiring work of the river floods, cutting away and forming new banks, is expressed by the inhabitants of the Amazon Valley under the terms "igapó," "varjem," and "terra firma."

The igapó is the newest alluvium of the convex margin, whose elevation is not above high water mark, and is therefore annually overflowed. Its vegetation is well marked, producing woods of a soft and generally useless nature, excepting the Seringa (*Siphonia elastica*).

The varjem includes the country whose elevation is between ordinary and extreme high water, not subject to periodical overflows. Here are found the numerous varieties of the palm family, the mulatto wood, seringá, cacao, and others. It is also suitable for the cultivation of the sugar-cane.

The third, the terra firma, are the remains of ancient water-courses through which the rivers have formed their channels, and in the Madeira appear in the form of bluffs, not over 100 feet high, and formed of red and yellow clay. It is only on terra firma are found the hard and close grained varieties of wood valuable in commerce. Therefore, from the Lower Madeira will never be exported any large quantities of valuable woods, though they abound in the vicinity of the falls of the Madeira.

In a word, then, the Lower Madeira flows its entire course through a flat country, with occasional bluffs not over 100 feet high. Its banks are annually overflowed from February to the middle of April. The lowest stage of the river is in October. It commences to fall about May 1, and averages about 6 feet a month till July 1, when it goes down more rapidly at a rate of not less than 8 feet.

The average rise and fall is about 40 feet, and the extreme difference between high and low water has ranged as high as 48 feet.

CLIMATE.

The temperature is always high, but the nights are not uncomfortably hot. The highest reading of the thermometer was on July 23, at 2 p. m., 91°, and from 83° to 88° may be considered the daily temperature from 8 a. m. to 8 p. m.

July and August are the hottest, as well as the driest. But there are at times a cold wind from the southwest in the summer months, when there is a great and uncomfortable fall. We experienced two such days at anchor 200 miles from the mouth, when the thermometer fell as low as 70°, and did not rise above 77°.

Observations of our wet-bulb show that the moisture decreases very much as the river is ascended.

At San Antonio, while the mercury frequently goes to the nineties, the heat is not as oppressive as in the Lower Amazon, where there is not evaporation enough in the air to cause the wet-bulb to fall below the outside temperature.

The nights at San Antonio are very much cooler than near the mouth, there being a difference of ten degrees. The great difference of temperature between day and night at San Antonio makes rheumatism a frequent complaint.

The experience of the *Enterprise*, and what I have gathered from other sources, lead me to believe that the valleys of the Amazon and Madeira may be considered healthy. Persons navigating these rivers would be no more subject to disease than if engaged in similar occupations on the Western rivers.

The *Enterprise* has been three months on constant service on the Upper Amazon and Madeira, and we have not had more than a half dozen cases of intermittent fever, and these mild.

San Antonio is notoriously unhealthy. No satisfactory reason has ever been given, and it is alleged that the water remaining in the hollows in the rocks after the water falls stagnates, and throws out pestilential vapors. Probably so, but the real cause, in my opinion, is in the small creeks which run into the river above the town, and a large lake back of it. As the water dries up by evaporation, there being no outlet, vegetable decomposition takes place rapidly, and no doubt is the reason for the large amount of sickness, for I have never in my life seen a more unhappy and unhealthy body of men than the workmen on the railroad at San Antonio. Hardly a single one had escaped attacks of fever, and the pale and cadaverous looks of nearly all of them was truly pitiable.

The rainy season may be said to commence in November and end in April. The largest rain-fall is in the months of January, February, March, and April. The rain-fall is, however, at no time excessive, and the largest amount in any one month, as gauged at San Antonio, was a total of 15.85 inches in the month of January.

The following gauge of the rainfall at San Antonio, as measured by

the English engineer at this place in the year 1873, will illustrate the seasons and may not be uninteresting :

January	15.85	July	0.32
February	10.87	August	1.07
March	14.89	September	5.70
April	11.01	October	1.94
May	5.96	November	11.32
June	2.56	December	10.03

There is a wide difference between what is known as the rainy season in the Valley of the Amazon and the same on the Isthmus of Darien. There is not the soaking, drenching rains for days at a time of the latter, but rain interspersed with much pleasant weather.

Insect life is found here in all its varieties, and the two pests of travelers in tropical South America, mosquitoes and piums, are found in full vigor on the Madeira.

The piums, a small black fly of the size of a gnat, are in great numbers at the Falls of San Antonio, and, enveloping their victims in clouds, inflict very irritating and painful bites upon every part of the body uncovered. They commence at sunrise and continue till sunset, when they give way to the mosquitoes.

To Americans fresh from home the latter are annoying in the extreme, and whether anchored in the middle of the stream or at the bank there is no peace from them till their attacks are evaded under the shelter of a bar.

INHABITANTS.

It is only within the past twenty-five years that the Madeira has been peopled to any extent by any other than the wild Indians. In 1749, the Portuguese sent a large expedition from Para, by the way of the Madeira, to the mines of Matto-Grosso, on the Guaporé River, a tributary of the Madeira above the falls.

When Lieutenant Gibbon descended it in 1854, in his expedition across the Andes, he found a small settlement at Crato and the town of Borba, with a few scattering huts in the lower part.

What gave a great impetus to its settlement was the unrivalled excellence of its rubber, and the yearly increasing demand for it throughout the world. So that now, from the best information I could gather, there are at present, including Portuguese, Brazilians, blacks, and domesticated Indians, about twelve thousand people scattered along its banks. This whole population may be said to be engaged in the production of rubber. It is doubtful whether there will be much increase in this number, unless the price of this gum should go so much higher as to stimulate the lazy Brazilians to increase its production.

The country is now generally taken up from within fifteen miles of the banks with estradas leading to all the rubber tracts, and to increase the supply the natives must go more into the interior. Here comes in the fear of attacks from the Indians, and what is almost as bad to the indolent Brazilian, the necessity of carrying his rubber a long distance by land.

A quarter of a century ago the Madeira was principally peopled by wild Indians. The chief of these were the Muras, the Mundurucus, the Papunhas, Parintintins, and Capunhas.

It is not probable that any of these tribes were ever very numerous, because, from the natural aversion to the Indians to labor, they would be obliged to subsist principally on game, which is not plentiful. Of the above, all but the Parintintins and the Capunas have become domesti-

cated. At every hut owned by a Brazilian laborer there will be found one or more families of Indians, who, though seemingly independent, are bearers of water and hewers of wood. What remains of these Indians have been collected by the government in the two missions of San Pedro on the Madeira, and San Francisco on the Machado, a tributary of the Madeira.

The term "Tapayo" is applied to the domesticated Indians of the Lower Amazon, and as a class are industrious and intelligent. They form the crews of all steamers upon the Amazon, in preference to whites or blacks. The girls make excellent servants, skillful with the needle, and are sought after by the Brazilians of the better classes, who bring them up from mere childhood in their families.

In appearance they are far superior to our North American Indians, readily adopting the civilized habits of the whites, cleanly in their persons, faithful in their attachments, and possessing among the females much real beauty, which can hardly be said of any squaw of our home tribes.

The Parintintins are, on the contrary, remarkably savage and ferocious. They have steadily refused all intercourse with the whites or Brazilians, and murder indiscriminately either the latter or domesticated Indians whenever they meet them alone. They are crafty but cowardly, always attacking by stealth. They are said to be cannibals, but whether so or not, they cut off and carry away the head and right hand of their victims. They inhabit the high land about the Machado and Timbuqué rivers about one hundred miles below the falls, and so great is the fear of them that the entire right bank, though rich in rubber, for an hundred miles is without an inhabitant, and no Bolivian dares to pass down alone in his montaria, or camp on the east side of the river within this section.

The following account of this tribe was given to me by a merchant of the Madeira, and interesting as coming from a near neighbor of this dread foe:

The Parintintins Indians live on the banks of the rivers Madeira and Machado (or Matamues), on the right-hand side going up. These Indians are ferocious and untamable, and their constantly repeated attacks on the neighboring villages and the passing canoes, with their attendant assassinations, make them the terror of the nearest settlements. Their last barbarities were committed during the months of January and February of this year. In January six persons who unguardedly passed through the forests on the right bank of the Machado River were murdered. In February five Bolivian merchants who were fishing up the river from the mouth of the outlet of the small lake called the Tamburguy suffered the same fate.

Generally, after making incisions of a span's depth in the bodies of their victims, they cut off their heads, and sometimes one or two arms, which are carried to the festivals which immediately follow their successful attacks. They always travel naked, one or two of their number using feather ornaments, to induce the belief that they are the chiefs or commanders of their tribes. Their color is nearly white (Mameluca), and report says that their children are very handsome and well formed.

The barbarous acts of these Indians during the years 1871 and 1872 alarmed the Bolivians, who wished to explore the country and export its rich natural products, and seeing the impossibility of taming the savages, they formed a company of what was considered sufficient force to penetrate the forests. The real object of the expedition was conquest. Five days of foot travel brought the party to an Indian town, where there was a feast over the head of a person recently murdered on the river. They killed some, wounded others, and, their ammunition being expended, allowed many to escape.

A few young children of the head men were captured, and allotted to those who were willing to "lend themselves to a work so clearly defined in favor of humanity." Their efforts produced no good results, and the report of their examination to a government unwilling to use force to exterminate "these wild beasts" or to take active measures to suppress their violence, has been of no avail. This indifference of the government and the disastrous occurrences in this district have forced the inhabitants of St. Roque and Buena Ventura to abandon their habitations, rubber-producing estates, machineries, &c., with great prejudice, if not entire ruin, to their interests.

In 1871 the government established a missionary station on the Machado River, which has been put in charge of an Italian priest, Theodoro Maria Portharara, during his life or pleasure. This priest, of astute character, even at the cost of great sacrifices and the risk of his life, has been unable to penetrate near the vicinity of the Parintintins, although in his last attempt he was accompanied by 300 men from the mission of San Francisco.

It would be tiresome to read an account of the barbarities committed by these Indians in this part of the country. From the opposite bank of the river the victims of the savages receive no assistance in food, fuel, or supplies. After attacking and entering a town the savages set fire to the houses.

Above the Parintintins, in the interior and at the mouth of the Jamaré, an affluent of the Madeira, there is another savage tribe called the Caungapyraugas, who, although untamable, are not as ferocious as the others. Further on we find the Carypunas tribe, more domesticated.

The inhabitants of the Lower Madeira may be divided into two classes, the *seringueiros* or *negociantes*, and the *laborantes*. The former, few in number, are either Portuguese or Brazilians, and through them the whole transaction of collecting the native products of the forests are carried on. They collect about them a great or less number of the poorer classes, Brazilians, negroes, mestizoes or Indians, according to their wealth and influence. They all keep small stores, at which are supplied all the wants of their dependents, in barter for whatever the poorer classes can procure that is valuable. They buy the rubber and the *copaiba* at not more than half its value, and give in exchange rum or "cachaça," farinha, cotton goods, and hardware, at a profit probably of an hundred per cent. The consequence is the poor laborante is always in debt to his master. Many of them make fortunes, but the system of credit and debit is so general in this country that they lose a great deal in bad debts from their men. In no other way could I account for their not becoming wealthy, for their profits are enormous.

ANIMALS.—FISH.

Ascending the Amazon or Madeira, the stranger is struck with the absence of game. Not even the all-abundant monkey was seen by the *Enterprise* in its passage of the river. Probably the submerged state of the banks in the rainy season causes the game to seek higher lands.

The *anta* or *tapir* is met in large numbers in the vicinity of the falls of the Madeira, as also deer and peccary, and the *onça* or American leopard. But for the reasons above stated these animals are rare on the Lower Madeira.

Parrots, paroquets, macaws, toucans, and many other varieties of birds are very numerous. But the lack of game is amply made up with the large quantity of fish in the Amazon and all its tributaries.

The one fish greatly prized by the natives is the *piracuri*, which attains often a size of eight to ten feet in length. On account of its abundance, and the place it fills in the food supply of the inhabitants, it may well be called the codfish of the Amazon. It is not caught with hook and line, but shot with bow and arrow, and on coming to the surface is harpooned and secured. The head cut off and the vertebra removed, it is laid in large flakes on a platform of bamboo to dry. Large quantities made up in bundles of an arroba, thirty-two pounds each, are sent to Pará, and form an important article of diet there and the neighboring seaport villages.

The *peixe-boá*, or cow-fish, from the resemblance of its snout to the nose of a cow, is highly esteemed. It is the same as the *manati* of the Rio Atrato, and in fact is not a fish, but a mammal, and should, I think, be classed with the seal family. The Madeira abounds in turtle,

of which there are said to be four varieties—the Tortaruga Grande, Cabeceira, Tiocajo, and Matá-Matá. The Tortaruga Grande is the one most sought after and in the most abundance.

The common practice of catching the turtle is to shoot them with a loose barbed arrow. The barb is secured to the arrow of cane with a small line. When it enters the turtle's shell it is disengaged, and the shaft of the arrow floats attached by the line. They are also caught with a baited hook, but the former is the favorite method. Every seringero on the Madeira has his turtle-pond back of the house, where great numbers are kept. They constitute a favorite article of food with all classes of Brazilians, rich and poor.

Owing to the destruction of vast quantities of turtle-eggs on the praias of the Madeira during the breeding season, August and September, for the purpose of making tortaruga manteca, or turtle-oil, their numbers have been greatly diminished. But as on this account the manufacture of turtle-oil on the Madeira is no longer profitable and has been discontinued, it is probable the supply of this very necessary article to the inhabitants of the Madeira will now keep up with the demand. The destruction of turtle-eggs is, however, actively carried on on the Solimões or Upper Amazon, where the tortaruga is still abundant. A species of land-turtle known as the "iabuty" is common on the low ground of the Madeira River, and it is highly prized for food.

PRODUCTS.

The products of the Madeira may be said to be such as are entirely extracted from the forest or river.

While the lands bordering on the river are fertile, and would produce large quantities of cacao, mandioca, plantains, maize, and tobacco, one sees in passing nothing beyond a little clearing around the huts of the natives, upon which are growing a few scattering plantains. Higher up, near the falls, where the Bolivians have settled with their Mojos Indians, more attention is given to the cultivation of the soil, and they have large plantations of plantains, mandioca, and maize; but it is the exception, and confined to the more wealthy Bolivians, who make their places their homes.

The Portuguese and Brazilians, only looking on their residences as temporary, seem to have no interest in the improvement of their places, and their one dream is to make a fortune in "borracha," the commercial name for rubber, and retire to Lisbon or Para, though probably few realize it. The great product of the Madeira is rubber; all other pursuits or employments are given up for the extraction of this valuable gum.

From the best authorities attainable I should put the production of rubber from the Madeira at fifty thousand arrobas, or one million six hundred thousand pounds. This, at thirty-five cents per pound, the current price in Para, would make five hundred and twelve thousand dollars. The value of the other productions from the river is insignificant.

The rubber tree, known here in Portuguese language as *seringa*, on the Atrato, another great source of supply, as caoutchou (*Siphonia elastica*), is not found below Borba.

The *siphonia* grows best where it is exposed to the annual overflow of the river, and therefore is found in its highest state on igapó, the more recent deposit, and vargem or older deposit. It grows also on the terra firma, for it is found about the falls of the Madeira, but I am inclined to

think the sap is not of as good a quality as where the tree grows in a moister soil.

The season for gathering rubber may be said to commence in June, and extends to the following February, when the different "estradas" paths become impassable from the overflow. These estradas lead out from the hut of the seringero, embracing all the trees in the neighborhood. The sap, which resembles cow's milk, is collected in little tin cups that will hold about two gills. The collector starts at early daylight, and as he reaches the trees he cuts a gash in the bark with his machete, and the cup is stuck in just below, so as to catch the sap as it exudes. Four cups are used, which are placed opposite, but on the same circle. They are first arranged at the top, as high as the hand can reach, then shifted down day by day to the ground. They are then again placed at the top in different positions, the idea being in this way to cover the whole surface. The cups being set, the collector begins to gather the sap, visiting the trees and pouring the contents of the cups into a calabash. Where the trees are distant they are visited but once, nearer twice a day. Reaching home, he empties the milk into one of the large turtle shells which are always found at the door of a hut on the Madeira, and proceeds at once with the smoking process, which is generally done in a low hut constructed for the purpose, as the resinous parts will soon separate and produce an inferior article. An earthen jar, without bottom and with a short, narrow neck, is placed over a fire made of the nut anajá or uanassei palm, whose smoke alone has the power of quickly coagulating the seringa. The operator, pouring a little of the milk on the surface of a small wooden shovel or canoe paddle, taking care to distribute it thinly and evenly over the surface, turns it slowly over the smoke until thoroughly stiff. This goes on until all the sap is exhausted or the cake becomes unwieldy. A slit is then cut in the plancha, the paddle slipped out, and a stick run through the mass, on which it is suspended to allow the water to evaporate. Enough planchas are collected on one stick to make an arroba, thirty-two pounds; it is then tied up with bark, and in this condition is ready for market. The skins at the bottom of the cups, the drops at the foot of the trees are all preserved, smoked, and made up in a round mass, forming an inferior article known as semambo or cabeca de negro. One man will probably collect from five to ten pounds per day.

The *Siphonia elastica* is a noble tree, often 100 feet high, and 24 inches in diameter. Its leaf is elliptical, about the size and somewhat resembling our elm, and of a light-green color. A tree milked as described will not last more than twelve years, and gives very little sap towards the close of this period.

I am told that in fifteen years after planting they can be tapped for their sap. Under the system pursued, as the valleys of the Madeira and Purus are the producing rivers, it would seem as if the supply of this gum has about reached its maximum, for many of the trees have died, and the country has been well prospected. Before long, however, it will commence to diminish, and then the Brazilians will regret that they have not done what would have been the case in any other country, planted young trees to keep up the annual production.

Destructive as is this method finally, it is not as bad as the one practiced in the valley of the Atrato and Darien, where the tree is at once cut down and destroyed, which has compelled the caoutchaudos of those regions to seek for caoutchouc at constantly increasing distances.

On the Amazon the stranger will hear the terms seringa and borracha both applied to this staple product. Properly speaking, seringa is not only applicable to the tree, but to the sap collected in the cups, while

borracha applies to the article after its prepared for market. One never hears the traders speaking of the *seringa* he has bought, but the *borracha*, and it is so termed in the market of Para.

Rubber is worth about 25 cents per pound on the Madeira, when at 40 cents, the present selling price, in Para. The difference, less freight and tax, small, of course, on a pound, is what the traders make, increased probably by an hundred per cent. profit on the goods with which the rubber is bought, for rarely is money paid down to the native collector; the result of which, at the close of the season he is always in debt to his *seringuero*, for if a little ahead the latter is sure to excite the desires of the native with some useless but high-priced bauble, for instance a music-box, which will bring the balance on the side of the shrewd Portuguese.

Though rubber is by far the most important article of export of the Madeira, there is a good deal of oil of *copaiba*, *castauha* or Brazil nut, some *guarauá*, and a considerable amount of dried fish, "*peracarú*," produced. The oil of *copaiba* is not like the milk of the rubber, the sap of the tree from which it is obtained, but is an unctuous substance contained in a crack in the center of the tree. The latter is therefore bored with an auger to the center, a tap put in, and the juice flows out and is collected in large carboys. From one to five gallons may be obtained, but the flow is immediate, and the tree is not drawn upon oftener than twice a year. This strange oily substance drained from the core is as necessary to the existence of the tree as the sap taken from the rubber, and in a few years they die, giving less each time from the first yield.

The noble *castauheira*, from which the Brazil nuts are collected, grows only on *terra firma*, and to a great height. The nuts, so familiar to us, are contained in a very hard exterior shell of about the size of a coconut, fifteen nuts in a shell. The tree being too lofty to climb without inconvenience, the natives wait for the shells to drop from the tree, which occurs in February and March. This outer covering is so hard that I have seen an axe fly off at the first blow without breaking it. Turned off and polished, very pretty and ornamental cups are made from them. The natives of the Madeira press the kernel of these nuts into a paste, which they afterwards dry in large copper pans, also used in the preparation of *farinha*, of which they make a kind of bread, and the oil is used by the women in dressing their hair.

The *guaraná*, made from the seeds of a small plant of the *Paullinia sorbilis*, is made to some extent on the Madeira, though the largest supply comes from the district of Mauhis, back from Villa Bella. These seeds are crushed into a pulp, rolled up the size of a Bologna sausage, and dried, in which state they almost exactly resemble one.

The dried tongue of the *Picarucú* is used to grate the *guaraná*, of which about a teaspoonful in a tumbler of water, sweetened with sugar, is used. In taste it resembles slightly that of almonds, but a little bitter, and, though palatable, there is nothing seemingly about it which accounts for the avidity with which it is sought for in the interior of Brazil and Bolivia, where it brings \$3 per pound, while selling on the Amazon for 50 cents. It is said to possess medicinal qualities, and to be very soothing to the nervous system.

SURVEY.

The *Enterprise* anchored off the mouth of the Madeira at 3 p. m. on the afternoon of June 17. The large island of Trinidad extends across the mouth, dividing the Amazon into two channels, while a third, caused

by the island Autuz comes out by the mouth of the Madeira and is divided from it by what is known as Madeira Island. The latter flowing parallel with the Madeira would produce the impression that it is one and the same as the Madeira, but the great difference of current marks immediately that it is a part of the Amazon and not its tributary.

Considering the great length of the Madeira, its mouth is insignificant, not more than one mile wide between the point of Madeira Island and the island of Porças, to the east, with a depth of seventy feet.

The lower portion of the Madeira is affected entirely by the level of the Amazon for its depth. As the Amazon does not commence falling before the middle of June, while the Madeira is much earlier, there is in consequence a backing up of the latter, so that at the time we passed up for the first fifty miles the banks were not more than two feet out of water, which was about the same as on the main river.

The ship anchored at 5 p. m. 15 miles from the mouth, at the first clearing on the river, at the foot of the island Orucurutuba. Here are two small bluffs 25 feet high, the first seen; and a small outcropping of trap, the only rock met with in the first hundred miles.

Thirty miles from the mouth, at the head of the island of Rosahuiha, is found the first shoal place of the river. At this time there was 6 fathoms upon it. When we passed down in the same place but five ditto, and when the Amazon is at low water there will not remain more than 2 fathoms.

A survey of the Madeira soon becomes as monotonous as one of the Amazon. At first it is a great relief to be away from the vast expanse of the great river, and to be able to take in at a glance both banks, without the feeling of littleness that one experiences on the Amazon. But the same everlasting tree line, the deep silence, only broken occasionally by the screech of a parrot, the absence of animal life along the banks, except the lazy crane or the pretty kingfisher, so characteristic of the Amazon and tributaries, soon wearies, and there remains little of interest to distinguish one day from another as we pass up the river.

After passing the island of Rosahuiha the current increases to two miles per hour, and varies from this to two and a half knots for the first two hundred miles.

There being no rubber gathering below Borba, but a few inhabitants are met with up to this point. We maintained an average speed of seven and a half knots, which gave us about five miles over the ground. The banks of the Madeira, being entirely alluvial, are constantly undergoing a great change.

Numbers of islands are met with, the ends of which are to be avoided, as sand-bars always make out from them.

Forty-six miles from the mouth is met the Furo Canuman, which, running 180 miles to the eastward, empties into the Amazon under the name "Furo Ramos," just below Villa Bella. It is navigable the whole distance for steamboats, the land is reported fertile, and a considerable population of Brazilian and Mudurucus Indians are settled upon it.

Sixty-four miles from the mouth is the town of Borba, on the right bank, on a bluff 30 feet above the ordinary river stage. It was the first town settled on the river, founded originally by the Jesuits, in the middle of the last century. There is a small production of tobacco, which has an excellent reputation, but the amount is insignificant. Borba presents the signs of decaying existence; the forests in the vicinity do not yield rubber, and probably most of the inhabitants who have had the energy to do so have gone higher up in the rubber region.

Just above the island of José Joao, at a place known as Inatarouta,

there is a praia in the middle, which should be avoided, as in the Enterprise we found but 3 fathoms upon it. The best channel runs close to the west bank, not more than one hundred feet distant.

Ten miles below Sapucaiaroca there are a number of rocks in the river the whole length of the illos Gauchos. The channel lies over on the west side of the island, which is free from rocks, and as close to it as the lead will permit a vessel to go.

Sapucaiaroca is a settlement of Muras Indians, the only pure Indian town to be met with on the river. The Muras are a treacherous, lazy set, and are but little liked. They may be said to be half civilized, have a tumbled-down church in the village, and no longer molest the inhabitants, though a half century ago they were much dreaded; but a perpetual feud with their more powerful neighbors, the Mundurucus, have reduced them in numbers and spirit.

The Madeira is deeper opposite the town than at any other place on the river.

There are no more obstructions on the river until the island of Araras is reached, where there are many rocks on the river-bed opposite the small settlement of that name. The river narrows here, the current is strong, but we did not find less than six fathoms in the channel, which is near the west bank.

At the foot of the island of Uroá, 200 miles from the mouth, the Enterprise anchored on the afternoon of June 21, five days from the mouth of the Madeira.

Five positions were fixed by observation coming up, and on our return four other intermediate points, so that in a distance of two hundred miles seven positions beside the two termini, or one in every thirty miles, have been accurately determined.

The survey of the Madeira up to the point of anchorage has been conducted in the same manner as in the plan described upon the Amazon. With one survey carefully checked every 30 miles the only errors that can creep in are those of speed. With a regular number of revolutions always maintained, there remains the single error of current. But with a maximum of three knots and a minimum of two knots, as found by our observations, and which could be determined in a great degree by the character of the river whether wide or narrow, we rarely found our line more than a half mile out of position as defined by our observations; and this, applied to the whole day's work, would not make an appreciable error in the position of any particular point.

The Madeira varies from half a mile to a mile in width; and nowhere in the channel was found up to Uroa Island less than 6 fathoms. Later, in the middle of July, such places had 5 fathoms, and probably the river would fall 18 feet more to extreme low water.

The channel to the west of Uroa Island had long been an object of dread to the navigators of the Madeira River, on account of the rapidity of the current, and the number of bowlders in the passage, which caused great eddies in the stream, and gave an appearance of danger more imaginary than real.

Our pilots declined the responsibility of taking the ship through, and ignorance on my part of the situation compelled me to be governed by their opinion. The crippled condition of our machinery, working with but one engine, liable at any time to catch on the center and not in condition to back, added to the difficulties of the situation, and forced me, with reluctance, to give up the idea of proceeding farther up in the ship.

Measures were at once taken to prepare the steam-launch for the

further survey of the river to the head of navigation. The water-tanks were taken out and coal-bunkers put in their stead, which enabled me to increase the total amount of fuel to 4,000 pounds. Lieutenant Blocklinger was selected to command the party, assisted by Lieut. C. P. Perkins as astronomer, and Mr. Sparrow as surveyor and draughtsman. The crew consisted of three seamen, a machinist, fireman, and pilot.

Ample provisions for eight men for a month were provided, with all the necessary equipments, including two chronometers. The launch is small, having but 28 feet length and 9 feet beam; therefore I added the dinghy to be towed with part of the provisions, and which would enable the party to have a small boat at hand if needed.

It was not expected that the coal would run the launch but a short distance, and funds were provided to purchase wood as fuel. They were compelled to cut the wood in short pieces of six inches, and this proved to be one of the most fatiguing duties attendant upon the expedition. It was found out by accident that the Anaja nuts used for smoking the seringas, made a hot fire, and after that, when they could be procured, made an excellent substitute for fuel.

The principal difficulty experienced in using the launch in our survey arose from the great deviation in the compass. It was found not possible to swing the boat properly so as to arrive at any reliable data, and even if it were, there was really no place in the already overcrowded little steamer where it could be of use and not interfere with other equally important objects.

Finally we had recourse to deflecting angles, using the dumb compass screwed to the draughtsman's table. Though the latter could give us no true course, it would give us the angle between a course already obtained and the bearing from this to some other point from which the launch would be headed. Thus, before starting in the morning, the magnetic compass would be taken on shore, and the bearing of an object taken, which would be the first course. This was laid by the dumb compass, the launch headed for it, and upon ending the line, the number of degrees to the right or left of this line of another object ahead, for which the launch would be steered, would be laid off.

The plan worked admirably in practice, but it required the most unceasing watchfulness on the part of the observer, Mr. Sparrow, for a single error would throw out all the remaining work of the day, and he is deserving of great credit for the painstaking fidelity with which he kept up his work. It was necessary, in order to keep our survey correct, that the positions obtained nightly should be worked up at once, which employed Lieutenant Perkin's time the greater part of the day. Lieutenant Blocklinger had all he could attend to in managing the steering of the launch, the cooking of food, and in providing supplies of fuel. The crew was necessarily reduced to the smallest number possible with efficiency, and the work required of all hands was such as to tax each to his utmost, and during the long period the boat was away the thorough manner with which my orders were carried out elicited my highest approbation.

It was not possible in a boat of so small power to be able to make much headway against the current, so the upward voyage was employed in making a traverse of the banks, keeping close to the shore, and on the return the channel would be run and soundings made.

My directions to Lieutenant Blocklinger were that he was not to make more than 25 miles per day, and observations were to be taken every night, which would enable him to maintain a close check upon the day's survey; also, to follow up the slackwater side, keeping out of

the strength of the current as far as possible. It was my intention at first to have taken charge of the party in person, but a desire to make a personal examination of the Uroa Rapids, and a feeling that something might turn up during the long absence that should require my presence on board, made me come to the conclusion to go up later in one of the trading-steamers of the Madeira, and come down from San Antonio in the launch, sounding the channel. Besides, I felt I could acquire much useful information from the pilots, not to be had in any other way, as circumstances had caused me to put but little confidence in our own. The launch left the ship at 7 a. m. on Tuesday, June 25.

During our stay at Uroa working parties were sent on shore to cut wood for steaming purposes. The experiment of burning wood and coal had proved very successful. It was found that sixty pounds of steam could be maintained with a speed of 7 knots, and that 300 sticks of wood represented about a ton of coal. This amount of wood cost us \$5, while coal on the Madeira cost us \$28. This was an important saving, and one that should be remembered if ocean steamers are ever called upon to make the voyage from Para to San Antonio. Had I known it I could have saved the government the \$1,000 I paid as freight for a hundred and twenty tons to the mouth of the Madeira in a lighter. Of course, there is a great difference in the wood. If very green, it makes steam with difficulty; but partially dry, with a light bed of coal, it answers finely.

The rapids of Uroa, that I propose to make a more special survey of, are distant some six miles from the foot of the island where we were anchored.

To make soundings in a rapid current of 3 miles an hour, with a row-boat, was no easy matter.

I left the Enterprise at daylight, in the gig, accompanied in whaleboat by Lieutenant Nichols and Ensign Hunt. Had some difficulty in finding a suitable place for a base-line, on account of dense undergrowth on the banks. Finally measured one of 440 feet, and fixed by sunset sufficient signal-stations on each bank to cover the river to the head of the so-called rapids, though they are really nothing more than great eddies in the stream caused by large boulders.

In my absence during the day a naval steam-launch, commanded by a lieutenant of the Brazilian navy, arrived with a letter to me from the president of the province of Amazonas, Barou de Maracajú. The correspondence between the president and myself has already been laid before the department, and to keep up the line of events it is only necessary to state the purport—that is, the Enterprise was in the Madeira River without permission of the Imperial Government of Brazil, while that river was not open to foreign men of war, and he requested that I would immediately retire in my ship to the Amazon. He was correct in saying that I had not the necessary *visé*, but as I understood in leaving the United States that such had been promised, I replied that I thought he must be mistaken in his assertion; but, however, if he still declined to grant the necessary permit, upon hearing from him, I would depart. I felt assured before I could get answer to my letter our survey would be in such a state of forwardness as to enable me to carry out my promise of retiring from the Madeira without slighting the important work for which the Enterprise has been dispatched from the United States. As I supposed, his excellency replied that he could not grant the required permission, but by that time I was on my return from San Antonio to the Enterprise, which upon reaching, our survey being completed, we dropped down by easy stages to the Amazon.

The base-line measured and stations determined, we proceeded to run lines of soundings over the rapids, the stations at different times being occupied by Lieutenant Nichols, Master Wright, and Ensign Hunt. Simultaneous sextant angles were taken upon the sounding-boat at the dropping of a flag. The survey was very laborious on account of the strength of the current. Thirty-two cross-lines were run, the river averaging about a mile wide, and four up and down lines, at equal distances, by myself, Lieutenant Spalding being with me to record the soundings. After pulling a down line the boat had to be pulled up the shore in slack-water to the head of the survey, making just double the distance, as the current was too strong to be pulled against. Altogether, about eight hundred soundings were put in. We found rocks with from 3 to 6 fathoms upon them, and close aboard 11 to 13 fathoms. The rocks seemed large boulders, some of them 30 feet high, scattered indiscriminately on the bottom. But a good channel was found 300 yards wide, with 7 fathoms over the whole distance.

Going up, to run this channel a vessel should approach them from the middle of the river, and bringing the western point of Uroa (the only one in sight) directly astern, headed for the point on the opposite bank where the grass meets the clay bank, a point of contact distinguished at a long distance or on a course.

When the upper end of Uroa Island is well opened on the port bow, all danger is passed. The channel is also distinctly marked by smooth water between the whirlpools.

Going down, abreast the upper end of Uroa, approach the west bank within 600 yards and head for the point of the island below and ahead. This should bring the stern on a line from this point to the end of the clay bank where it meets the grass. Should the railroad be completed and ocean steamers ascend the Madeira, two buoys placed at the upper and lower ends of channel will make it easy to run.

The repairs to our machinery being completed, the *Enterprise* dropped down, on the 3d of July, to Araras Island, where I had had a lighter of coal from Para left for the ship.

The survey of the Madeira, as far as could be performed by the *Enterprise*, being completed, I awaited the first steamer to ascend the Madeira and join the steam-launch in the survey of the remaining portion to the falls of San Antonio.

During our stay at Uroa Island, from June 21 to July 3, twelve days, the river lowered $3\frac{1}{2}$ feet, but later, from July 3 to 22, it fell 7 feet, making a fall of about 10 feet in a month.

On the afternoon of July 4 I went on board the side-wheel steamer *Canuman*, Alberto Moraes, captain, bound for San Antonio. The *Canuman* was an American-built iron side-wheel steamer, drawing about 7 feet loaded, and constructed after the pattern of our western river boats, with separate engines. This American type, not found in any steamers of English build, is in great favor among the steamboat owners and pilots of the Amazon and its tributaries, and I doubt if any more steamers for river navigation are ordered in England, unless there is a great difference in price in their favor.

The life on board the river steamers of the country is decidedly cosmopolitan. No state-rooms or berths are provided, for no person in this country travels without his hammock, known as "*réde*," which, upon coming on board, he hangs in such part of the upper deck as best suits him. It is a cleanly arrangement, giving much more room, and better suited to the climate and people, as berths would be intolerably hot and

alive with vermin. An inclosed room is set apart for women amidship, where they also sling their *rêdes* from hooks in the bulkheads.

Coffee is served at 6 o'clock in the morning, and two meals afterwards, breakfast at 11 o'clock and dinner at dark.

The Brazilians are great talkers, and have interminable discussions upon all subjects, in which the parties work themselves up to such a pitch of excitement that a person new to the scenes would think it could not fall short of blows, but a third party will step in, then another, and it goes no farther than a war of words.

The Canuman, being a general freighting boat, was loaded with a great variety of merchandise for a hundred different points. All the Seringueros may be said to be storekeepers in a general way; that is, they buy their lands and their rubber in goods. They all have their connections in Para, from whom they buy on credit and remit in produce.

The progress of the Canuman up stream was slow, and it did not reach Manicoré, a town at the mouth of a small river of that name, till the following afternoon, making about sixty-five miles in twenty-four hours.

Manicoré, with its row of white plastered houses, situated on a bluff 90 feet above the river, is one of the few fixed towns on the Madeira, and contains probably 500 inhabitants.

The Manicoré River is ascended about 30 miles by steamers, and supports a considerable population. It is lined with bluffs, and, with no breezes in consequence to ruffle its surface, is very hot and uncomfortable to navigate.

At Marinellas, 58 miles above Manicoré, was the only flower-garden I met with. The owner seemed in comfortable circumstances, judging by the quantity of rubber he shipped on our return, and his signora displayed neatness about her house and a variety in her flower-beds rare to find in this country.

Baetas, 30 miles above, though placed on some maps as a town, consists of but a single store. There is a large lake, however, behind, upon which many India-rubber collectors are located, and in this way Baetas is a river port of some consequence. It was here that I obtained my first reliable information about our launch, which placed her some two hundred miles ahead, and going on finely when she passed Baetas.

There is little variation in the navigation of the Madeira. Numerous islands, which cause the channel to shift from side to side, and occasional bluffs of never more than 70 feet high, are the only breaks to the uniformity of the banks, which at this point and season are about 20 feet out of water.

The next point of interest was the mission of San Pedro under the auspices of the government, presided over by an Italian friar of the order of Jesuits. Here are collected some 400 Indians from different parts of the Madeira. While a poor church denoted that spiritual instruction is not neglected, a room pointed out to me as a school-room indicated that there was some attempt made to instruct the youth.

The mission boasts a town clock, the work of the ingenious friar, the construction of which no doubt helped to increase his influence with his superstitious flock. These Indians live a free, lazy life, while collecting a sufficiency of *borracha* and oil of *copaiba* to give them the means of satisfying their love of finery, and the good friar, while attending to the spiritual needs of his flock, does not hesitate to avail himself of their temporal wants by engaging in a little trade on his own account, buying their produce in exchange for goods. He seemed to be the per-

son most interested in the stock of goods landed by the Canuman, and, in the words of the captain, was a "born comerciante."

Above San Pedro the settlers are principally from Bolivia. They are from the vicinity of Trinidad and Santa Cruz, and their haciendas have comparatively a thrifty look, with large fields of plantains, mandioca, and sugar-cane. These Bolivians have brought and settled near them numerous Mojos Indians, who are considered as belonging to the family of the proprietor, though they are free and work for hire. There is an understanding that they shall receive so much per day, but their employer has authority to employ them as he pleases.

These Mojos are by far the best type of the laboring class that I have seen on the river. They are strong, industrious, and docile, and there is a look of neatness about them foreign to the Brazilians of the same class, or domesticated Indians of the Madeira. When our steamer would touch at one of their places for wood, they would take hold in the most cheerful way, and commence wooding without a word, even though at midnight.

The Mojos women struck me very forcibly. Naturally tall, the habit of carrying weights on their heads has given them an erect and graceful carriage. They wear their shining black hair brushed close back and plaited in two long braids behind. Their only dress is the camiseta, a loose gown with short sleeves, suspended from the shoulders, and well adapted for easy movements in a warm climate. Assembled often on the bank in numbers as the steamer stopped to wood or land freight, their modest demeanor, neat appearance, and graceful beauty could but produce a pleasant impression on the passing stranger.

Above, 130 miles from San Antonio, we pass on the left bank the small village of Crato, next to Borba the oldest settlement on the river. It has fallen into insignificance in its rivalry with Humayita, an enterprising little place a mile above on the same side.

The latter town contains about 400 people, and its prosperity is due to the energy and wealth of its principal merchant, Signor Manuel M. de Moraes, who ships yearly more *borrachas* than any other one person on the river, and also supplies large quantities of fire-wood for the steamers.

Forty-two miles above is the Machado River on the right bank. On a branch called the Prieto, 8 miles from the Madeira, is another Indian mission called San Francisco, founded by the government, composed, like the one at San Pedro, of the remnants of different tribes of the Madeira, and is in charge of a friar of the order of the Franciscans. This mission is situated in the country of the dreaded Parintintins, the most savage and warlike of all the tribes of the Madeira. But little, therefore, of the products of the forest are collected beyond some oil of copai-ba, as the domesticated Indians are very much in fear of their more savage brethren. The friar told me he had made three attempts to hold intercourse with the Parintintins, but without success. He went to their town, six leagues distant, making the sign of the cross as he approached, but, though they offered him no harm, they all left the village, refusing to hold any intercourse with him.

The Parintintins are found about the rivers Machado and Timbucú, and such is the dread of them, that for 50 miles on the right bank in the vicinity not a habitation is to be seen.

Twenty-three miles above the mouth of the river is Abelhos. An island of the same name divides the river. In high water the channel is to the west of the island, but when the river is half down, steamers must pass through the east channel, which is one of the few dangerous

points of the Madeira. The channel opposite Abelhos is full of rocks. Steamers must pass up to the east and at the side of the praia that makes out from the island. When nearly abreast the foot a white clay bank on the opposite or east side will bear about three points on the port bow; cross the river here, heading for it, and it will lead between the rocks. There is a considerable settlement at Abelhos, and large quantities of rubber are exported.

We arrived in the Canuman at Abelhos on the morning of the 11th, and to my surprise I learned that our steam-launch was two miles below, as I had fully expected at this time it would have been at San Antonio. Sent four hundred pounds of coal by a boat which the captain kindly loaned me, and he also consented to wait until the launch came up, which, with the aid of the coal, she finally accomplished. Found that for twelve days, up to the 7th of July, the launch had done finely, making twenty-five miles as a day's run with ease. After this date the boiler gave them a great deal of trouble, and they had been five days making fifty-one miles. Lieutenant Blockinger attributed the difficulty to the collection of sediment over the crown-sheet and tubes from the long use of muddy water; but that with a coal fire he felt assured he could make the remaining sixty miles to San Antonio. I accordingly purchased a ton of coal from the Canuman and gave him directions to sail with all dispatch. She started in the afternoon just after ourselves, and when lost sight of at night was making good progress.

To guard against a possibility of the launch breaking down, I took Lieutenant Perkins with the chronometers on board the Canuman.

From Abelhos to San Antonio, 60 miles, the river is clear of all difficulties except at Samandua island. The praia of Samandua is the largest on the lower Madeira, and until lately was the resort in August and September of numbers of natives to hunt for the eggs of the turtle known as the *Toraruga Grande*, but the turtle by this indiscriminate destruction on its breeding-ground have decreased so much in numbers that it is no longer profitable to seek for their eggs for the making of mantiega tortaruga, or turtle butter.

Finally San Antonio is reached at the foot of the lower falls of the Madeira and the head of navigation, 574 miles from its mouth. San Antonio would be an insignificant place but for being the starting-point of the Madeira and Marmoré Railroad, designed to connect the upper and lower Madeira Rivers by a railway 180 miles long.

Two abortive attempts have been already made to carry out this enterprise. A third is now being made by Messrs. Collins, of Philadelphia, who have been at work since February. They have had great difficulties to encounter, on account of indifferent labor and the distance from Para, their only base for supplies. They have already completed and ironed three miles, and it is my private opinion that the experience, perseverance, and energy of the Collins Brothers will carry it forward, provided the means are furnished them from the money derived from the Bolivian loan originally issued for the purpose, and which is now locked up in litigation in the English courts at London.

I remained three days in San Antonio, giving us sufficient time for its correct establishment, which is latitude $8^{\circ} 48' 13.6''$ south, longitude $63^{\circ} 55' 05.5''$ west.

Our steam-launch did not put in an appearance, though it had had ample time, and I felt great uneasiness with regard to her.

I left San Antonio Monday morning, July 15, carrying the survey down myself in the Canuman. The same afternoon we met the steamer *Iavary* coming up, and our missing launch in tow. Cast her off, and towed her with us to a short distance above Abelhos where the Canu-

man anchored for the night. Lieutenant Blocklinger reported that shortly after losing sight of us on the evening of the 11th, that the steam suddenly dropped from 60 pounds to 10, forcing them to anchor. That they had worked incessantly to clean out the boiler, but without any result, and had finally returned to Abelhos under oars. There was nothing to do but to take the launch in tow, and continue the survey in the Canuman. This I was enabled to do with complete success, through the courtesy of her captain, who offered me every facility. The shoreline had been put in by the launch on her up trip, and as the Canuman going down kept in the deepest part of the channel, we were enabled to mark this out correctly. Soundings were taken every five minutes, and we had the benefit of the experience of the two excellent pilots of the steamer in locating any rocks or obstructions which had escaped our attention.

At Abelhos occurred the only mishap of the expedition, in the capsizing of the dinghy in the rapids, by which most of our remaining provisions and clothes were lost.

We reached Manicoré on the night of July 19. On the way down it had been ascertained that the difficulty with the steam-launch did not arise from sediment in the boiler, but from the leaking of the upper end of tubes in the steam-space. Of course the steam escaped as fast as made, though it could not be readily detected except by filling the boiler and putting on a pressure. These tubes were all, therefore, expanded, and as the Canuman was to go up the Manicoré River, I left in the launch the next morning for the *Enterprise*, now at anchor off Araras Island, which we reached without difficulty the same afternoon.

During my absence the river had fallen 9 feet. As the survey was now virtually completed, we got under weigh on July 22, and proceeded by easy stages to the mouth, which was reached on the 24th. Here a base line was measured, and several important points were established in the vicinity of the junction of the Amazon and the Madeira, which finally completed our work.

It is evident that the weight of the survey of the Madeira fell upon one steam-launch, and it was no small undertaking to go, in this little steamer, several hundred miles against a strong current. Such an undertaking must necessarily be accompanied with much hardship and personal inconvenience.

Fortunately the weather was good throughout, and the health of the officers and crew did not seem to suffer any from the exposure. Lieutenant Blocklinger is deserving of great credit for the perseverance and energy with which he pushed on, and I was not disappointed in finding in him the necessary qualifications for the important position for which I selected him.

Lieutenant Perkins was necessarily entirely occupied with the astronomical determination of the position reached each night, upon the correctness of which depended the whole value of our survey, and he performed this duty with great credit to himself and to my entire satisfaction.

The bulk of the work during the day fell upon my assistant, Mr. Sparrow, C. E., and this gentleman has been untiring in his efforts to make our work both reliable and complete. The necessity of using deflecting angles from the dumb compass compelled him to give, during the launch's running, an absorbing overlook which would not admit of a moment's respite.

NAVIGATION OF THE MADEIRA.

It would be impossible to give general sailing directions that would be of any practical value. The river is constantly changing, and at all

times a person unfamiliar with its course would require a pilot. But the channel line is laid down correctly on the charts made by the expedition, and by a close study of these charts one would very soon be enabled to act independent of a pilot. With the information, for instance, that I could now derive from our charts, I would not have hesitated to have taken the Enterprise to San Antonio in spite of the declaration of our pilot that she could not go above the Uroa Rapids.

As a general rule, it may be understood that 6 fathoms can be carried from the mouth to San Antonio from January 1 to June 1. After the latter month the river falls with considerable rapidity, but still 4 fathoms may be depended upon till the middle of July. Between this period and the middle of December the Madeira is not safe for any but river steamers of 6 feet draught, which can navigate it at all periods in the dry season.

While it would be useless, as remarked, to attempt to give any general directions, it will be well to enumerate the few points where navigators should be particularly on the lookout for shoal-water.

Our survey of the Madeira is divided among thirteen sheets on the scale of a nautical mile to the inch. The soundings were taken during the middle of July, and should be reduced by 15 feet or $2\frac{1}{2}$ fathoms for low water in the middle of October. The soundings are in fathoms.

The following are positions to be carefully sounded :

Sheet No. 1.—Upper end of Rosahiuha Island; praia to east bank; channel about in center.

No. 2.—Abreast of island Popeicoca; playa on each side; channel in middle.

No. 3.—Clear.

No. 4.—Abreast upper island dos Ganchos; rocks along west bank; channel as near island as depth by lead will permit. Abreast bluffs of Mataranta; channel close to west bank; praia extends to middle of river.

No. 5.—Abreast village of Araras and upper end of island; rocks in middle and east bank; channel close to island. Upper end of Uroa Island; rocks in river; channel in mid-river. (See special chart.)

Nq. 6.—A line from Punto Espirio Santo to Casa de Oliviera should clear both praias of islands de Conepapa, but the one on lower island extends well out, and should be felt for with lead.

No. 7.—Praia on point between Island Iatuarana and Capana, makes well over to the opposite shore, which must be followed close. Rocks on east bank abreast head of island Bieju-assú; keep in middle of stream or as near island as the lead will permit. There are rocks off Manuellos, but they are only dangerous at low water.

No. 8.—Head of island Viado; there are rocks at low water on east bank. Keep as close to praia on island side as lead will permit.

No. 9.—Off center of island of Jurara channel is in mid-stream, but as praias are on both sides, they are liable to change, and one should proceed with caution at low water. At Carapanatuba Point, channel leads straight across to opposite point to avoid rocks above.

Nos. 10, 11.—No remarks required.

No. 12.—Just above Papagaio, dangerous rocks close to shore and two in middle of river. But there is plenty of water between, and the latter may be distinguished by the whirlpools about them. Dangerous rocks off Abelhos Island, channel on east side close to island till the lower point of the upper island is reached, where cross, heading for clay bank on opposite shore and a little above.

No. 13.—Tamandúa Island; channel lies on east side, close to island and praia, to avoid rocks in midstream. There is a deeper channel ob-

tained, I am told, by hugging east shore, between rocks and bank, but I had no opportunity to examine it. Bar off San Antonio, just below and close to town. River but half full; should sound before attempting to cross.

It will be interesting, in conclusion, to investigate how far the Madeira River can be made conducive to American interests. The division of the river, by its falls, leaves us only the lower portion to consider, for until this natural obstacle is overcome there will be neither emigration to Bolivia nor increased demands for American produce beyond the consumption of the last fifty years. In regard to the lower Madeira the estimated population is 12,000; this is probably over than under. They are engaged entirely, as Keller expresses it, in extracting the wealth of the forests, and it is not probable this number will be increased, as the best rubber districts are all taken up. As a population their wants are few. Their food consists mainly of turtle, dried pirarucú, and farinha: the first two obtained right at their doors, the last brought principally from Pará. For the other demand of this population no better guide can be given than the description of the cargo of the Canuman, which consisted of 3,198 packages, composed of demijohns (large and small, containing cachaca, wines, and vinegar, and cases, rolls, bales, baskets, and barrels of salt beef, sugar, matting, medicines, powder, soap, kerosene, ship's bread, lead, rice, fireworks, leather, farinha, dried fish, beans, milk, bitters, cider, sardines, onions, potatoes, stearine, and stearine candles, soda, biscuit, pepper, salt, pork, lard, dried beef, Florida water, perfumery, beer, cummin seed, window-glass, cheese, preserved meats, lime, varnish, wax, tar, cognac, champagne, codfish, hardware, furniture, &c., and fabrics of wool, cotton, and linen.

I find among the merchants of the Amazon and the Madeira a most excellent feeling towards the American products and manufactures. The demand for American staples is constantly increasing, and I am persuaded that in proportion to population there is a larger demand for American goods in the valley of the Amazon than in any other portion of Brazil.

As already remarked, the trade of the lower Madeira is mostly in the hands of old and well established Portuguese firms, and it would not be worth while to attempt to force in a new element. What America wants is a more extended demand for her productions, and this can be realized much more successfully through the agency of native firms, than attempting a ruinous rivalry with them.

There are four steamers at present on the Madeira, which can make the round voyage to and from Pará in six weeks, and they are more than ample for the present demands of the trade.

In the event of the completion of the railroad to the Upper Madeira, which will open entire new avenues, I believe there will be presented a most excellent field for American capital, enterprise, and productions. But it must be early on the spot, as the merchants of Pará are enterprising and shrewd, and aim at controlling entirely the whole business of the Amazon Valley.

CONCLUSION.

There is little to be added in conclusion to the report. It will have been seen that the Amazon is capable of navigation for the largest class of steamships for a thousand miles from its mouth. That the Madeira River can be ascended by ocean steamers to its falls, or the commencement of the proposed railroad around them, from December to August. That while the immediate vicinity of the Amazon is so low as

to be yearly inundated and its soil is not especially adapted for cultivation, the region drained by its tributaries is of a vast amount, with soil of unsurpassed fertility, abounding in wide pampas where roam thousands of cattle, and immense forests of the most valuable woods or furnishing drugs of the highest commercial importance. That though this vast region is watered by great rivers, tributaries to the mighty Amazon, their navigation is totally obstructed by rapids and falls in every case at variable distances from their mouths. That the railroad enterprise around the Madeira, projected and carried on against immense obstacles by American energy and perseverance, would open a rich productive country, in the improvement of which the United States is directly interested, but which latterly British jealousy bids fair to render abortive.

The population of the region bordering upon the Amazon is small. Nature has bountifully supplied them with the necessities of life, and, therefore, their demands for productions of outside nations is not large, but increasing every year.

The manufactures of the United States are held in high esteem; for example, asking once a merchant how our goods compared with those of other countries, he replied, "We like those of the United States the best, because we know they are always good."

It has been shown time and again that the United States is the commercial ally of Brazil. We can furnish everything the country requires, and as cheaply and of better quality than those of Europe. But the entire lack of facilities has turned the channel of trade completely from us. It is estimated that on an average there is at least an arrival of one steamer a day in Brazil from England.

It is vitally necessary, if the United States will take its share of the foreign business of Brazil, to create avenues of trade by which such will flow to our shores.

These are first of all a well-established steam line, with feeders to different ports. Such line must in its infancy be fostered by the government in order to compete with the old established European lines, until the trade directed by them to our country will enable them to take care of themselves.

There should be direct telegraphic communication between the two countries. To the energy of our own countrymen we are indebted for the first successful Atlantic cable, and why cannot one be laid to Brazil?

A bank through which exchanges could be favorably made is also very necessary for the easy flow of commerce.

I would strongly urge upon those American firms that manufacture or sell goods required by Brazil that they should act in concert, and establish sample houses in the important centers of trade. They should be represented by enterprising agents, speaking the language and acquainted with the wants of the country. Such should be encouraged by liberal commissions rather than salaries.

Our products can better be introduced in this manner through native houses than by attempting to establish large concerns in rivalry with them. But especially it must be remembered that steam communication is absolutely necessary first of all, no matter how high and excellent our manufactories may be.

I have the honor to be, very respectfully, your obedient servant,
THOS. O. SELFRIDGE,
Commander, Commanding.

Hon. R. W. THOMPSON,
Secretary of the Navy, Washington, D. C.

Barometric heights Amazon and Madeira Rivers.

MADEIRA RIVER.		AMAZON RIVER.	
Place.	Altitude above sea-level.	Place.	Altitude above sea-level.
	<i>Feet.</i>		<i>Feet.</i>
Albelioa	110.7	Manous	84.8
Conchicas	103.2	I. de Eva	81.3
Papagayos	101.8	Boca Medis	78.5
Ventura	100.4	Serpa	75.1
Bos Esperanza	99	Furi Resaca	74.5
Papunhas	97.6	I. de Frixal	73.9
Tres Casas	96.2	I. de Paovai	73.2
Caropanatuba	94.8	Villa Bella	69.9
Castanhar	93.4	I. de Cabesa	66.6
Sun Antonio	92	Santa Anna	60.3
Marmelos	90.6	Obidos	55.9
Itaroro	89.2	Santarem	51.6
Manitoto	87.8	Sotio-de-Toro	47.3
Locadio	86.4	Head of Frixal Island	43
Espiro Sanid	85	Prainha	39.7
Orna	81.7	Carupa	34.7
Bos Esperanza	80	Narrow Pass	24.7
Casa Alegre	79.5	Jutavy Light	14.6
Sapucalaroca	79	Para	10
Borba	81.7		
Canuman	80.1		
Boca Madeira	78.5		

Date.	Barometer.		Average dry-bulb thermometer.		Average wet-bulb thermometer.	
	Highest.	Lowest.	Highest.	Lowest.	Highest.	Lowest.
1878.						
June 4	30.19	30.06	87	79	85	78
June 5	30.17	30.05	88	78	86	78
June 6	30.18	30.03	87	79	84	79
June 7	30.17	30.04	84	79	82	79
June 8	30.15	30.02	87	79	85	79
June 9	30.14	30.00	85	80	84	80
June 10	30.15	29.99	86	82	85	81
June 11	30.16	30.06	86	80	84	80
June 12	30.15	30.05	86	80	84	80
June 13	30.20	30.11	85	81	84	81
June 14	30.20	30.12	83	79	83	79
June 15	30.16	30.03	84	80	82	79
June 16	30.14	30.10	87	79	85	79
June 17	30.16	30.08	87	80	85	80
June 18	30.16	30.05	87	79	84	79
June 19	30.16	30.03	88	79	84	79
June 20	30.10	30.04	88	79	84	79
June 21	30.10	30.01	87	80	85	79
June 22	30.11	30.04	86	80	83	80
June 23	30.11	30.03	87	79	83	79
June 24	30.09	30.02	84	79	82	79
June 25	30.10	30.02	85	78	82	78
June 26	30.05	30.00	84	78	82	78
June 27	30.06	29.99	86	78	83	78
June 28	30.09	30.02	86	79	84	79
June 29	30.07	29.99	86	78	83	78
June 30	30.07	30.00	86	77	84	77
July 1	30.08	30.02	87	76	85	76
July 2	30.07	30.03	87	76	86	77
July 3	30.08	30.03	87	78	84	79
July 4	30.06	30.04	88	79	85	80
July 5	30.07	30.00	87	80	84	80
July 6	30.06	30.00	87	78	85	78
July 7	30.07	30.02	87	78	86	79
July 8	30.07	30.03	86	77	83	78
July 9	30.15	30.05	75	70	75	72
July 10	30.10	30.08	82	70	81	71
July 11	30.10	30.04	85	75	84	76
July 12	30.10	30.05	85	76	82	77
July 13	30.14	30.08	87	77	85	77
July 14	30.17	30.12	87	78	85	79
July 15	30.13	30.07	87	78	84	79

Date.	Barometer.		Average dry-bulb thermometer.		Average wet-bulb thermometer.	
	Highest.	Lowest.	Highest.	Lowest.	Highest.	Lowest.
1878.						
July 16.....	30.14 —	30.06 —	87 —	78 —	84 —	80 —
July 17.....	30.08 —	30.01 —	87 —	78 —	85 —	80 —
July 18.....	30.07 —	30.03 —	87 —	80 —	84 —	82 —
July 19.....	30.05 —	30.00 —	88 —	78 —	86 —	78 —
July 20.....	30.06 —	30.00 —	88 —	79 —	84 —	79 —
July 21.....	30.09 —	30.03 —	87 —	79 —	85 —	81 —
July 22.....	30.09 —	29.98 —	90 —	78 —	86 —	79 —
July 23.....	30.17 —	30.05 —	91 —	80 —	88 —	81 —
July 24.....	30.16 —	30.05 —	84 —	79 —	83 —	81 —
July 25.....	30.11 —	30.04 —	87 —	78 —	86 —	79 —
July 26.....	30.15 —	30.05 —	88 —	78 —	83 —	79 —
July 27.....	30.16 —	30.07 —	86 —	79 —	83 —	80 —
July 28.....	30.15 —	30.06 —	87 —	77 —	85 —	78 —
July 29.....	30.13 —	30.05 —	86 —	78 —	85 —	79 —
July 30.....	30.16 —	30.06 —	88 —	77 —	84 —	78 —
July 31.....	30.16 —	30.08 —	88 —	76 —	85 —	76 —
August 1.....	30.18 —	30.10 —	88 —	80 —	86 —	80 —
August 2.....	30.18 —	30.09 —	87 —	80 —	85 —	80 —
August 3.....	30.16 —	30.10 —	88 —	78 —	86 —	79 —
August 4.....	30.15 —	30.08 —	86 —	78 —	86 —	79 —
August 5.....	30.15 —	30.07 —	88 —	80 —	85 —	80 —
August 6.....	30.16 —	30.09 —	88 —	81 —	86 —	82 —
August 7.....	30.13 —	30.07 —	88 —	79 —	87 —	79 —
August 8.....	30.16 —	30.08 —	88 —	81 —	86 —	82 —
August 9.....	30.16 —	30.08 —	88 —	81 —	85 —	82 —
August 10.....	30.14 —	30.07 —	87 —	80 —	86 —	80 —
August 11.....	30.14 —	30.06 —	87 —	76 —	86 —	77 —
August 12.....	30.14 —	30.07 —	88 —	77 —	87 —	78 —
August 13.....	30.14 —	30.08 —	88 —	81 —	87 —	82 —
August 14.....	30.18 —	30.13 —	87 —	80 —	85 —	81 —
August 15.....	30.18 —	30.10 —	87 —	78 —	85 —	78 —
August 16.....	30.20 —	30.11 —	81 —	76 —	81 —	77 —
August 17.....	30.21 —	30.13 —	87 —	78 —	84 —	79 —
August 18.....	30.20 —	30.12 —	86 —	80 —	84 —	80 —
August 19.....	30.18 —	30.10 —	85 —	78 —	84 —	78 —
August 20.....	30.16 —	30.10 —	86 —	79 —	85 —	78 —
August 21.....	30.20 —	30.11 —	87 —	79 —	84 —	80 —
August 22.....	30.18 —	30.13 —	87 —	80 —	86 —	81 —
August 23.....	30.21 —	30.12 —	88 —	79 —	86 —	80 —
August 24.....	30.17 —	30.09 —	86 —	79 —	83 —	80 —
August 25.....	30.16 —	30.09 —	86 —	79 —	84 —	80 —
August 26.....	30.18 —	30.11 —	88 —	79 —	86 —	80 —
August 27.....	30.22 —	30.14 —	89 —	80 —	86 —	80 —
August 28.....	30.20 —	30.14 —	89 —	78 —	87 —	79 —
August 29.....	30.23 —	30.11 —	86 —	77 —	84 —	77 —
August 30.....	30.22 —	30.16 —	85 —	78 —	83 —	79 —
August 31.....	30.22 —	30.15 —	86 —	78 —	83 —	79 —

Exportation of products of Amazonas from July 1, 1874, to June 30, 1875.

Articles.	Quantities.	Custom-house valuations.	Rate of duty.
			P. cent.
Arbutus (medicinal root).....	pounds. 792	\$218 00	10
Animal oil.....	gallons. 77, 280	6, 661 68	10
India rubber, fine.....	pounds. 4, 215, 038	1, 342, 659 20	12
middling.....	do. 9, 722	134, 265 92	12
ordinary.....	do. 703	162 00	12
refuse.....	do. 599, 558	105, 290 88	12
Tar.....	do. 557	9 45	10
Cacao.....	do. 550, 888	38, 844 55	10
Brazil nuts.....	do. 2, 892, 626	108, 466 18	10
Dried beef hides.....	do. 6, 419	599 29	10
Salted beef hides.....	do. 83, 424	4, 399 62	10
Panther skins.....	do. 6	9 00	10
Dried deer skins.....	do. 2, 373	1, 655 38	10
Salted deer skins.....	pounds. 567	48 07	10
Dried beef.....	do. 1, 417	115 92	10
Salted beef.....	do. 429	50 25	10
Cloves.....	do. 1, 590	286 39	10
Camari beans.....	do. 513	102 22	10
Embria.....	do. 44	4 00	10
Oakum.....	do. 8, 403	764 73	10
Ginger.....	do. 55	4 00	10
Guaraná.....	do. 10, 430	4, 186 91	10
Maqueras de travessa (pieces of crooked wood).....	do. 40	18 00	10
Pieces of crooked wood.....	bundles. 8	33 75	10
Mixela, prepared turtle flesh.....	gallons. 2, 463	5, 508 90	10
Copaiba oil.....	pounds. 94, 081	30, 951 92	10
Turtle eggs.....	cases. 6	6 00	10
Parasite vines.....	feet. 604	32 00	10
Unmanufactured cori.....	pounds. 815, 927	13, 812 57	10
Cori rope.....	yards. 13, 340	4, 510 05	10
Dried pirarucú fish.....	pounds. 2, 264, 549	100, 836 36	65
Salted pirarucú fish.....	do. 88	6 56	65
Dried ox fish.....	do. 161	8 25	65
Salted ox fish.....	do. 81	2 10	65
Panás mancas.....	yards. 79	8 64	10
Puaya.....	pounds. 64	7 25	10
Puxury (medicinal bean).....	do. 1, 487	444 67	10
Net of tucum palm.....	do. 1	9 00	10
Nets of mirity palm.....	do. 8	24 00	10
Sarsaparilla, in bundles.....	pounds. 50, 682	16, 932 32	10
Sarsaparilla, loose.....	do. 4, 400	1, 233 40	10
Crude tallow.....	do. 165	20 33	10
Cedar logs.....	feet. 3, 914	658 35	10
Logs of wood for joiner work.....	do. 996	730 40	10
Thread of Tucum palm.....	pounds. 143	65 00	10
Vigas (square logs of hard wood).....	feet. 550	168 00	10
Total.....		1, 984, 847 40	

List of exports from custom-house, Serpa, from July, 1877, to July, 1878.

	Quantity.
Rubber, fine.....	kilos. 220, 498
Rubber, sunamby.....	do. 45, 503
Balsam.....	do. 100
Castanha nuts.....	do. 218, 830
Cacao.....	do. 21, 083
Cumaru.....	do. 97
Beef hides.....	do. 963
Guaraná.....	do. 1, 784
Fish-oil.....	litres. 96
Oil of copaiba.....	kilos. 7, 600
Dried pirarucú (fish).....	do. 57, 595

Rubber and guaraná pays a duty of 12 per cent. to provincial custom-house; all other produce pays 10 per cent. to same.

All products pay in addition 3 per cent. to the Steam Navigation Company of the Amazon.

The above products include what is shipped direct from the Madeira River to Pará, and the produce of the district of Serpa is also included.

Population of the province of Amazonas, according to the only records obtainable.

	Males.	Females.	Total.
<i>Census of 1849.</i>			
Free—Of age.....	6,073	6,107	12,240
Under age.....	4,956	4,786	9,742
Slaves—Of age.....	198	231	429
Under age.....	140	131	271
Foreigners.....	80		80
Indians.....			
Grand total.....	11,447	11,315	22,762
<i>Census of 1851.</i>			
Free—Of age.....	7,815	8,772	16,587
Under age.....	6,776	5,685	12,461
Slaves—Of age.....	225	272	497
Under age.....	117	136	253
Foreigners.....	106		106
Indians.....			
Grand total.....	15,039	14,865	29,904
Increase of population in two years.....	3,592	3,550	7,142
<i>Census of 1873.</i>			
Free—Of age.....	7,789	7,337	15,126
Under age.....	7,217	8,202	15,419
Slaves—Of age and under age, 342; included in above.			
Foreigners, 632; included in above.			
Total to 1873.....	15,006	15,539	30,545
Increase since 1849.....	3,559	4,224	7,783
Increase since 1851.....		674	641
Decrease since 1851.....	33		

It will be observed that the native Indians are not taken into consideration or their number estimated.

Positions determined on the Amazon and

[United States steamer Enterprise, third rate.]

Locality.	Date.	Observer and computer.	Latitudes.	
			Observed body North.	Observed body South.
Para	June 3	Perkins.	For chronometer error	
Breves	June 5	Perkins.		
	June 12	Perkins.		
Santa Anna	August 9	Baker		Antares
	August 9	Perkins		Antares
Concacao	June 13	Baker		β Centauri
	June 13	Perkins	Arcturus	α^2 Centauri
Serpa	June 16, Aug. 2	Baker	η Ursæ Majoris	α^2 Centauri
	June 16, Aug. 2	Perkins	12 Canum Venat	
Casa Perara	June 17	Baker	η Ursæ Majoris	α^2 and β Centauri
	June 17	Perkins		α^2 and β Centauri
Calçara	June 18	Baker	η Ursæ Majoris	α^2 Centauri
	June 18	Perkins	η Ursæ Majoris	β Centauri
Sapucaiaroca	June 19	Baker	η Ursæ Majoris	α^2 Centauri
	June 19	Perkins	η Ursæ Majoris	β Centauri
Vieta Alegre	June 20	Perkins	Latitude assumed	
Boa Esperanza	June 20	Baker	Sumner's method	
	June 20	Perkins	Sumner's method	
Urna	June 21	Baker	η Ursæ Majoris	β Centauri
	June 21	Perkins	η Ursæ Majoris	β Centauri
Base line, Urna	June 20	Baker	η Ursæ Majoris	α^2 and β Centauri
East bank off Urna	July 1	Baker	η Ursæ Majoris	β Centauri
Southwest end Araras Isl'd	July 5	Baker	η Ursæ M. and Arc	α^2 and β Centauri
Espirito Santo	June 25	Perkins	α Coronæ Borealis	α^2 Centauri
Casa Leocadio	June 26	Perkins	η Ursæ Majoris	α^2 Centauri
Manicoré	June 27	Perkins	η Ursæ Majoris	β Centauri
Casa Itororó	June 28	Perkins	η Ursæ Majoris	β Centauri
Casa Manuelos	June 29	Perkins	η Ursæ Majoris	β Centauri
San Antonio (Chico)	July 1	Perkins	η Ursæ Majoris	β Centauri
Caetanhar	July 2	Perkins	η Ursæ Majoris	β Centauri
Carapanatuba	July 3	Perkins	η Ursæ Majoris	β Centauri
Tres Casas, Ilha de Botar	July 4	Perkins	η Ursæ Majoris	β Centauri
Pupunhas	July 5	Perkins	η Ursæ Majoris	β Centauri
Boa Esperanza	July 7	Perkins	η Ursæ Majoris	α^2 Centauri
Papagaio	July 9	Perkins	Arcturus	β Centauri
Jamary	July 11	Perkins	Sumner's method	
San Antonio	July 12, 13, 14	Perkins	Arcturus	α^2 Centauri
Humayta	July 17	Perkins	Latitude assumed	
Minhas	July 17	Perkins		
Boa Fortura	July 18	Perkins	Sumner's method	
Madeira River above Borba	July 22	Baker		Antares
	July 22	Perkins	α Coronæ Borealis	Antares
Borba	July 23	Baker		
	July 23	Perkins		
Canuman	July 23	Baker	α Coronæ Borealis	Antares
	July 23	Perkins	α Coronæ Borealis	Antares
Mouth Madeira, west point	July 25	Baker		Fomalhaut
	July 25	Perkins	α Cassiop	Fomalhaut
Manaos	July 25, 30	Baker	Vega	Antares and Sagitt.
	July 25, 30	Perkins	Vega	Antares and Sagitt.
Casa Casemiro	July 31	Baker	β and ν Draco	Antares
	July 31	Perkins	β and ν Draco	Antares
Furo de Resaca	August 3	Baker	ν Draco	Antares
West end Ilha de Freixal	August 5	Baker		Antares
	August 5	Perkins		Antares
Casa Carvalho	August 6	Baker	β Draco	Antares
	August 6	Perkins		Antares
Villa Bella (Matriz)	August 7	Baker	Vega	Antares
	August 7	Perkins	Vega	Antares
Ilha de Caldeiras	August 8	Baker	Vega	Antares
	August 8	Perkins	ν Draco	Antares
			Sumner's method	
Obidos	August 10	Baker		Antares
	August 10	Perkins		Antares
Boca de Lago Grande	August 12	Baker	β Vega β Draco	δ Sagittarius
	August 12	Perkins	β Draco	α Tri. and Antares
Santarém	August 13	Baker	ν Draco	Antares
	August 13	Perkins	ν Draco	Antares
Sitio de Toron	August 16	Baker	Sumner's method	
	August 16	Perkins	Sumner's method	
Mouth of Gurupatuba	August 17	Baker	Vega	δ Sagittarius
	August 17	Perkins	Vega	δ Sagittarius

Madeira Rivers, Brazil, South America.

Commander Thomas O. Selfridge, U. S. N.]

Latitudes.	South latitude.	Longitudes.			West longitude.
		Observed body East.	Observed body West.	Longitudes.	
	° ' "			° ' "	° ' "
1 40 55 +20	1 41 15	☉			48 29 15
2 04 28.9 +20		☉		55 59 34.5	50 28 08.7
2 04 47.9			Spica	55 59 31.5	
2 04 50.7	2 04 49.2	Altair	Spica	55 59 24	55 59 30
2 32 13		Arcturus	Regulus	56 55 57	
2 31 38.9	2 31 56	Arcturus	Regulus	56 55 05	56 55 31
3 06 45.7		Arc. and Altair	Reg. and Spica	58 26 05.8	
3 08 51.6	3 08 48.7	Arc. and Altair	Reg. and Spica	58 25 52	58 25 58.9
3 32 40.4		Antares	Spica	58 54 53.3	
3 32 43.2	3 32 41.8	Vega	Spica	58 54 48	58 54 53.7
4 15 13		Antares		59 24 40.5	
4 15 24.2	4 15 18.6	Antares	Regulus	59 24 25	59 24 32.8
4 48 41		Antares	Regulus	59 53 45	
4 48 43.3	4 48 42.2	Antares	β Leonis.	59 53 36	59 53 40.5
	4 53 15	☉			60 01 35
5 03 44		Vega and Antares.	Regulus	60 18 27.5	
5 03 28	5 03 36	Vega and Antares.	Arcturus	60 18 06	60 18 16.8
5 18 11.5		Vega	Spica	60 43 07.5	
5 18 27.1	5 18 10.3	Vega	Spica	60 42 55.5	60 43 01.5
	5 19 35.8	Antares	α and β Leonis		60 44 00.2
	5 18 44.4	Antares	β Leonis		60 41 25.5
	5 15 18.9	☉	Spica		60 33 25.7
	5 31 32.2	Antares	Regulus		60 50 50
	5 37 33.1	Antares	Spica		61 09 20
	5 48 40.1	Antares	β Leonis		61 17 12
	5 49 55.8	Antares	Regulus		61 33 20
	6 07 03.8	Antares	Regulus		61 49 07.5
	6 12 49.1	Antares	β Leonis		62 04 20
	6 32 32.6	Antares	β Leonis		62 20 33
	6 46 11.6	Antares	β Leonis		62 32 37
	7 00 12.6	Antares	β Leonis		62 46 22
	7 18 42.8	Antares	β Leonis		62 55 20
	7 41 24.6	Vega	Regulus		62 53 51
	8 10 33	Antares	Spica		63 03 48
	8 27 40	α Centauri	Spica		63 28 55.5
	8 48 13.6	Antares and Vega	Spica		63 55 05
	7 31 30	☉			62 59 06
	7 20 13				62 53 36
	6 14 47.7	Altair and Arc.	α Centauri		62 13 16.5
4 39 45		Altair	Spica	59 54 23.5	
4 39 07.8	4 39 26.4	Altair	Spica	59 54 10.5	59 54 18
4 22 42.4		☉		59 35 27	
4 23 24.3	4 23 03.4	☉		59 34 55.5	59 35 11.3
3 55 16.6		Altair	Spica	59 08 29	
3 54 55.8	3 55 06.2	Altair	Spica	59 08 40.5	59 08 34.8
3 22 80		Aldebaran	Jupiter	58 45 37.5	
3 22 41	3 22 35.5	Aldebaran	Jupiter	58 45 34	58 45 35.8
3 08 10.8		Altair	Spica	60 01 03	
3 08 00	3 08 05.4	Altair	Spica	60 00 48.5	60 00 55.8
3 08 44		Altair	Spica	59 20 02.5	
3 08 42.3	3 08 43.2	Altair	Spica	59 19 45	59 19 53.8
	2 49 53.4	Altair	Spica		57 54 57
2 25 56		Altair	Spica	57 33 08	
2 25 53.6	2 25 54.8	Spica	Altair	57 33 01.5	57 33 04.8
2 28 53		Altair	Spica	57 16 00	
2 28 50	2 28 51.5	Altair	Spica	57 16 01.5	57 16 00.8
2 37 35.2		Altair	Spica	56 43 33	
2 37 29.9	2 37 32.6	Altair	Spica	56 43 29	56 43 31
2 20 25		Altair	Spica	56 24 10.5	
2 20 34.5	2 20 34.8	Altair	Spica	56 23 46	56 23 58.3
1 55 04.2		Vega	Arcturus	55 30 12.8	
1 54 56.6	1 55 00.4	Vega	Arcturus	55 29 57	55 30 04.9
2 14 54.6		Altair	Spica	55 02 44	
2 14 48.3	2 14 51.5	Altair	Spica	55 02 40.5	55 02 42.3
2 24 54.1		Altair	Spica	54 42 04.5	
2 24 42.9	2 24 48.5	Altair	Spica	54 42 03	54 42 03.8
2 19 20		Alta Vega	Arcturus	54 06 43.5	
2 18 54.8	2 19 08.4	Alta Vega	Arc. and Jupiter	54 06 49	54 06 46.3
2 02 30.3		Altair	Antares	53 58 07.9	
2 02 25.6	2 02 28.0	Altair	Spica	53 58 24	53 58 16

24 N

Positions determined on the Amazon and Madeira

Locality.	Date.	Observer and com- puter.	Latitudes.	
			Observed body North.	Observed body South.
Praiaha	August 19	Baker	Vega	♂ Sagittarius
	August 19	Perkins	Vega	Antares
Serro Aramun	August 20	Baker	Sumner's method	
	August 20	Perkins	Sumner's method	
Fazenda Caridade	August 21	Baker	Vega	♂ Sagittarius
	August 21	Perkins	Vega	♂ Sagittarius
Boca de Gurupa	August 22	Baker	Vega	♂ Sagittarius
	August 22	Perkins	Vega	♂ Sagittarius
Gurupa	August 23	Baker	Vega	♂ Sagittarius
	August 23	Perkins	Vega	♂ Sagittarius
Boca de Itaquará	August 26	Baker	Vega	♂ Sagittarius
	August 26	Perkins	Vega	♂ Sagittarius
Ponta Aturia	August 27	Baker	Vega	♂ Sagittarius
	August 27	Perkins	Vega	♂ Sagittarius
Pharol Guajara	August 28	Baker	♂ Androm	Achemar
	August 28	Perkins	Sumner's method	
Pharol de Goiabal	August 29	Baker	Canopus	Achemar
	August 29	Perkins		Pom., a Grus
Pharol Contejuba	August 30	Baker	Vega	Pomalhaut
	August 30	Perkins	Vega	♂ Sagittarius, a Pao
Para	Aug. 31, Sept. 2	{ Baker	For chronometer error	♂ Sagittarius
		{ Perkins		

Rivers, Brazil, South America—Continued.

Longitudes.

Latitudes.	South latitude.	Observed body East.	Observed body West.	Longitudes.	West longitude.
° ' "	° ' "			° ' "	° ' "
1 48 30.7		Altair	Antares	53 27 54	
1 48 28.5	1 48 29.6	Altair	Antares	53 27 52.5	53 27 53.3
1 36 39		a Cyg., a Androm ..	Altair	52 55 20	
1 30 49.7	1 36 44.4	a Cyg., Vega	Jupiter	52 55 31.3	52 55 25.7
1 35 49.5		Altair	Arcturus	52 35 37.5	
1 35 40.7	1 35 45.1	Altair	Spica	52 35 41	52 35 39.2
1 27 05.6		Altair	Arc. and Antares	51 57 41.5	
1 26 57.2	1 27 01.4	Altair	Antares	51 57 30	51 57 35.8
1 24 14.6		Altair	Spica	51 37 36	
1 24 00.7	1 24 07.7	Altair	Antares	51 37 34	51 37 35
1 05 24.1		Altair	Spica	51 10 08.5	
1 05 19.6	1 05 21.9	Altair	Spica	51 10 10	51 10 08.3
1 28 10.4		Altair	Spica	50 45 24	
1 28 06.5	1 28 08.5	Altair	Spica	50 45 45	50 45 34.5
1 48 00		Sirius	Jupiter	50 11 24	
1 48 25	1 48 12.5	Sirius	Jupiter	50 11 10	50 11 17
1 37 30.4		Saturn	Altair	49 09 20.5	
1 37 39.4	1 37 34.7	a Ariet's	Altair	49 09 35	49 09 30.8
1 15 57.9		Markab	Arcturus	48 32 42.5	
1 15 58	1 15 58	Altair	Arcturus	48 32 08	48 32 25.8
.....	1 27 20	.....	.....	48 29 15	.....

No. 13.—ACTION BETWEEN THE HUASCAR AND CHILIAN SQUADRON.

UNITED STATES FLAGSHIP PENSACOLA (2d rate),
Coquimbo, Chile, October 24, 1879.

SIR: Knowing that the Navy Department and all naval officers would take much interest in a careful and technical description of the injuries sustained by the Peruvian iron-clad turret-ship Huascar in her recent combat with the Chilean iron-clads, I ordered a board of very competent officers, of whom Captain Breese was the senior, to examine and report upon these injuries; and I now have the honor to submit their report, with drawings to illustrate it.

I have the honor to be, sir, your obedient servant,

C. R. P. RODGERS,
*Rear-Admiral, Commanding
United States Naval Force, Pacific Station.*

Hon. R. W. THOMPSON.
Secretary of the Navy.

A.

REPORT OF BOARD ON INJURIES RECEIVED BY THE HUASCAR IN THE ACTION OF OCTOBER 8, 1879.

UNITED STATES FLAGSHIP PENSACOLA (2d rate),
Coquimbo, Chili, October 14, 1879.

GENTLEMEN: Should free access be given us to the iron-clad Huascar, recently captured by the Chilean squadron, you will visit that ship upon her arrival here, and will make a careful examination of the injuries she has sustained and the effect produced upon her armor and hull by the Chilean projectiles. You will make such sketches as shall be permitted, and will embody in your report all the information which will be interesting to the Navy Department and to naval officers, especially in relation to the ordnance, armor, construction, and engines.

You will carefully avoid doing anything that could, in any way, be considered objectionable by the Chilean authorities, and will carefully consult them in this respect.

I have the honor to be, very respectfully, your obedient servant,

C. R. P. RODGERS,
*Rear Admiral, Commanding
United States Naval Force on the Pacific Station.*

Capt. K. R. BREESE, U. S. N.; Chief Engineer E. D. ROBIE, U. S. N.; Lieut. R. R. INGERSOLL, U. S. N.; Lieut. D. KENNEDY, U. S. N. Lieut. T. B. M. MASON, U. S. N.

UNITED STATES FLAGSHIP PENSACOLA (2d rate),
Coquimbo, Chili, October 20, 1879.

ADMIRAL: We have to report that free access was given to all parts of the Huascar for the purposes set forth in your order of the 14th instant, prefixed and marked A, and that every facility was afforded by

the commander, Captain Peña, and the officers of the vessel, in making the examination described herewith.

The Huascar is an iron-clad ram, with a single turret on the Coles system, built of iron, in England, in 1865, at the Birkenhead Iron Works, by the Laird Brothers.

The principal dimensions are as follows:

Length between perpendiculars, 196 feet.

Breadth of beam, $35\frac{1}{2}$ feet.

Depth of hold, 21 feet.

Draught of water at deep-load displacement of 1,130 tons, forward, 15 feet; aft, 16 feet.

The rig was formerly that of a square-rigged brig without head-booms, but her foremast (a tripod much injured in the fight with the *Esmeralda*) was taken out, and the top-gallant forecastle was reduced in size to give a better range for the guns. The top-gallant forecastle is nearly triangular in shape, with an area of about 90 square feet, on which the anchors and the cat-and-fish davits are carried, and in which are the "heads" and chain compressors. The poop-deck is short, and is entirely open, having no thwartship bulkhead. It covers in the officers' galleries, the lamp-room, and a steering-wheel. The mainmast and main gaff are alone left standing. The maintop has a musket-shot-proof screen of iron to protect the gatling gun and its crew, as shown in Diagram D.

The hull is divided into five water-tight compartments by four transverse $\frac{5}{8}$ -inch iron bulkheads, with water-tight doors. These bulkheads are located at each end of the turret-chamber, fire-room, and engine-room, making separate compartments of them, and also of the forward and after parts of the vessel. There is also, near the bow, a transverse water-tight collision bulkhead to protect the vessel in case of injury to the ram.

The armor-plates on the hull, abreast of the turret-chamber, fire and engine rooms, are $4\frac{1}{2}$ inches thick, diminishing from these points forward and aft to $2\frac{1}{2}$ inches at stem and stern, and are backed by 10 inches of teak and the iron skin of the vessel, which is $\frac{5}{8}$ inch thick. The turret, on the Coles system, has an exterior diameter of about 22 feet. It has $5\frac{1}{2}$ inches of armor, backed by 13 inches of teak and a $\frac{1}{2}$ -inch iron skin. Just in front of the guns the plating is reinforced by 2-inch plates, and the backing decreased that much.

Just abaft the turret, and forward of the smoke-pipe, is the conning tower or pilot-house, of hexagonal shape. It is 7 feet 6 inches high above the deck, 8 feet wide, and 5 feet 2 inches in length (fore and aft), and is plated with 3 inches of armor backed by 8 inches of teak, with a skin of two $\frac{1}{2}$ -inch iron plates. The armor extends 6 inches above the backing, and is pierced with eight sight-holes, each 10 inches long and 1 inch wide. Formerly there was a bridge or walk over this tower.

The engines, also built by Laird Brothers, have two horizontal cylinders, with double piston-rods, and are back-acting. Each engine has an independent jet-condenser and air-pump.

The main cylinders are 40 inches in diameter, the piston-stroke 3 feet, and the indicated horse-power 1,200. There is an independent cut-off valve for each engine. There are four horizontal fire-tube boilers in the vessel and one smoke-pipe. Two of the boilers contain four furnaces each and the other two three furnaces each. They are placed on each side of a fore and aft fire-room, terminated by the transverse bulkheads before alluded to. There is no bomb-proof grating in the smoke-pipe and no superheating apparatus. There is a single screw entirely submerged.

The coal-bunkers have capacity sufficient to stow 300 tons of Welsh coal. On each side of the engine-room, separating it from the ship's side by a space 3 feet in width, there is a longitudinal $\frac{3}{4}$ -inch iron bulk-head, water tight, and extending to the transverse bulkheads forward and aft. No steam-log, indicator diagrams, nor any data in regard to the engine department were captured with the vessel, and it is reported that the eight engineers and four machinists who composed the Peruvian official personnel destroyed all the official documents by burning them in the boiler furnaces before the Chilians came on board.

The armament is as follows:

In the turret, mounted on Scott's turret carriages, two Armstrong 12-ton M. L. 10-inch shunt rifled guns, made in 1865, and numbered 1351 and 1358, and worked by hand.

The projectiles used in this fight were Palliser chilled armor-piercing studded shell weighing about 300 pounds. There is one 40-pounder Armstrong M. L. R. on the starboard side of the quarter-deck, one of the same size at the stern port under the poop-deck, and one light Armstrong 12-pounder M. L. R. on the port side of the quarter-deck, all mounted on wooden Marsilly carriages. In the main top is a .44 caliber long Gatling gun, and the ship's rifles are Remington, caliber .44.

From the official report of Commodore Rivers, commanding the Chilean squadron, it seems the action commenced at 9.15 a. m., on the 8th of October, off Angamos Point, Bolivia, by the Huascar firing her two guns at the Cochrane at a distance of 3,000 metres. This fire was not returned until about 9.25, when the Cochrane opened fire at 2,000 meters. The Blanco became engaged at 10.10 at a distance of 600 meters, and the vessel was surrendered at 10.55.

General Diagram, marked A, shows the location of the injuries received by the Huascar during the action. Each hit has an assumed number, for reference, in the detailed description.

No. 1, Diagram A, is from a 250-pounder Palliser chilled armor-piercing shell. This was a raking shot, striking the head of the stem, glancing upwards, and carrying away the bitts on the top-gallant forecastle.

No. 2, Diagram A, is from a 250-pounder; entered on starboard side of top-gallant forecastle, and went out on port side, carrying away the bitts, heads, &c., under the top-gallant forecastle.

No. 3, Diagram A, a glancing shot from a 250-pounder, striking a 44-inch plate about 3 feet above the water line abreast of the smoke-pipe, indenting but not cracking or penetrating the plate.

No. 4, Diagram A, from a 250-pounder shell, piercing the armor abreast of the engines $2\frac{1}{2}$ feet above the water-line, and entering just above the engine-room gallery, bursting in the armor-backing, tearing an irregular hole 4 feet by 3 feet 2 inches in its greatest dimensions, and curling up the inner iron plating. The explosion destroyed the engineer's stateroom on that side, carried away a portion of the engine-room gallery rail, and fragments of shell and splinters riddled the bulkheads on the port side. No injury resulted to the machinery.

Nos. 5 and 6, Diagram A, damaged the hammock netting on the starboard side aft.

No. 7, Diagram A, a 250-pounder shell pierced armor on starboard quarter $2\frac{1}{2}$ feet from the water-line, and nearly abreast the break of the poop-deck, and burst in the armor-backing, destroying a stateroom on that side, making an irregular hole in the backing and inner skin 4 feet by 3, breaking three deck beams, starting the spar-deck, and carrying away the iron leading-block for tiller-chains which led to the fighting-wheel under the conning-tower.

No. 8, Diagram A, a 250-pounder shell, entered near stern-post on star-board side, exploded in the backing, breaking off the head of the stern-post, breaking three deck beams, and carrying away blocks of relieving-tackles which were in use after the damage to the leading-block by shot No. 7.

No. 9, Diagram A, 250-pounder went through the wooden upper works of poop on the port side, and demolished the lamp-room under the poop on that side.

No. 10, Diagram A, went through hammock-rail on port side.

No. 11, Diagram A, a 250-pounder shell, entered port quarter, piercing the armor $2\frac{1}{2}$ feet from the water-line and about 10 feet forward of the break of the poop, and burst in the armor-backing, tearing an irregular hole, and destroying the stateroom on that side.

No. 12, Diagram A, a glancing shot from forward, struck armor abreast main rigging, making an irregular indentation about 2 inches deep in the armor plate. This shot probably carried away three of the chain plates to main rigging.

No. 13, Diagrams A and F, entered the forward port on quarter-deck on port side, breaking off the muzzle of the 12-pounder Armstrong gun, injuring the engine-room sky-light on port side, and the pin-rail abaft the mainmast.

No. 14, Diagram A, damaged the hammock-rail on port side, abreast the main rigging.

No. 15, Diagram A, a 250-pounder glancing shot, struck upper edge of side armor abreast the turret, on port side, scoring the side armor, and probably bursting, caused the scoring on the turret. (See Diagram C.)

No. 16, Diagram A, a 250 pounder shell, entered just abaft the forward bulkhead of turret-chamber, and burst in the wood backing, destroying the boatswain's room on that side.

No. 17, Diagrams A, B, and C, and sketch No. 1, Diagram C, a 250-pounder struck the plate which formed half the right gun-port. The hole is 2 feet from the port, and is generally oval in shape on the outside, 12 by 9 inches, and 15 inches from the deck line. The hole through the plate is quite smooth, and almost circular in shape, about 9 inches in diameter. The shell evidently exploded in the backing, making a jagged hole, 2 inches high by 16 inches wide in its maximum dimensions, and bending, and tearing the skin. The fragments struck the right trunnion of the right gun, injuring it, the cap square, the rim-base, and the corner of the carriage. There are also several scores on the gun, and on the beams overhead. The left edge of the plate was driven back 2 inches, and the upper right hand corner over the center of the port started out about 1 inch. A bolt over the port is started out 1 inch. The shot entered at about an angle of 30° with a normal to the surface of the turret.

No. 18, Diagrams A, B, and C, and sketch No. 2, Diagram C, a 250-pounder, struck the turret near the right side of the breech of the right gun 3 feet above the deck and near the left edge of the plate. The hole is about 15 by 12 inches on the outside, quite irregular, and oblique to the surface of the turret. The plate is driven back along the left side and top $1\frac{1}{2}$ inches, and the upper right hand corner started a little. The plate was split by the shot into three layers, giving it the appearance of laminated armor. The ring around the top of the turret, 1 inch thick by 3 inches wide, is broken and bent up. None of the bolts in this plate are started on the outside. It evidently burst in passing through the backing, as the hole on the inside is very jagged, about 2 feet by 1

foot 8 inches, and the skin is badly torn. Some of the pieces of the projectile struck the right side of the breech of the left gun, scoring it very much, in some places an inch deep, and smashing the sight-bar. The greater portion of the shell struck in the sighting-hole to the left of the left gun, tearing the iron beams and backing around it to a great extent.

No. 19, Diagrams A and G, and sketch No. 1, a 250-pounder shell, struck an angle of the conning-tower on the port side aft, breaking the 3-inch iron plate on its edge, as shown by sketch No. 1, and burst, destroying the fire-room ventilators and the forward part of the smoke-pipe casing above the deck, since temporarily repaired.

No. 20, Diagrams A and G, and sketches Nos. 1 and 3, a 250-pounder shell, pierced the after armor-plate of the conning-tower on the port side about 2 feet above the deck, making an irregular hole in the plate about 12 inches in diameter, and burst in the teak backing of the forward plate on the opposite side forcing off that plate, so that it fell on deck (sketch No. 3).

No. 21, Diagrams A and G, and sketch No. 2, a 250-pounder raking shot from aft, struck the after thwartship plate of conning-tower near its top, making an irregular hole as shown in sketch No. 2.

Shots 19, 20, and 21 are also supposed to have destroyed the bridge which crossed the deck over the conning-tower, and pieces of which were found on deck after the action. There were also a great many holes in the smoke pipe of various dimensions, as shown by Diagrams E¹ and E², and the deck was scored in many places but was not penetrated.

No. 22, Diagrams A, B, and C, a glancing shot, made an indentation on the turret 1 foot above the deck and near the left edge of the plate, 10 inches long by 2 inches deep, setting back the plate 1 inch.

No. 23, Diagrams A and C, a glancing shot, made an indentation on the side of the turret farthest away from the ports, about 8 inches long by $\frac{3}{4}$ inch deep. Near the latter indent are numerous small scores varying from 1 to 3 inches in length, and $\frac{1}{4}$ to $\frac{3}{4}$ inch in depth, probably from pieces of shell No. 15. On the starboard side of the deck about 3 feet from the turret are some scores which are very shallow, and have done no injury to the glacis plate which surrounds the turret.

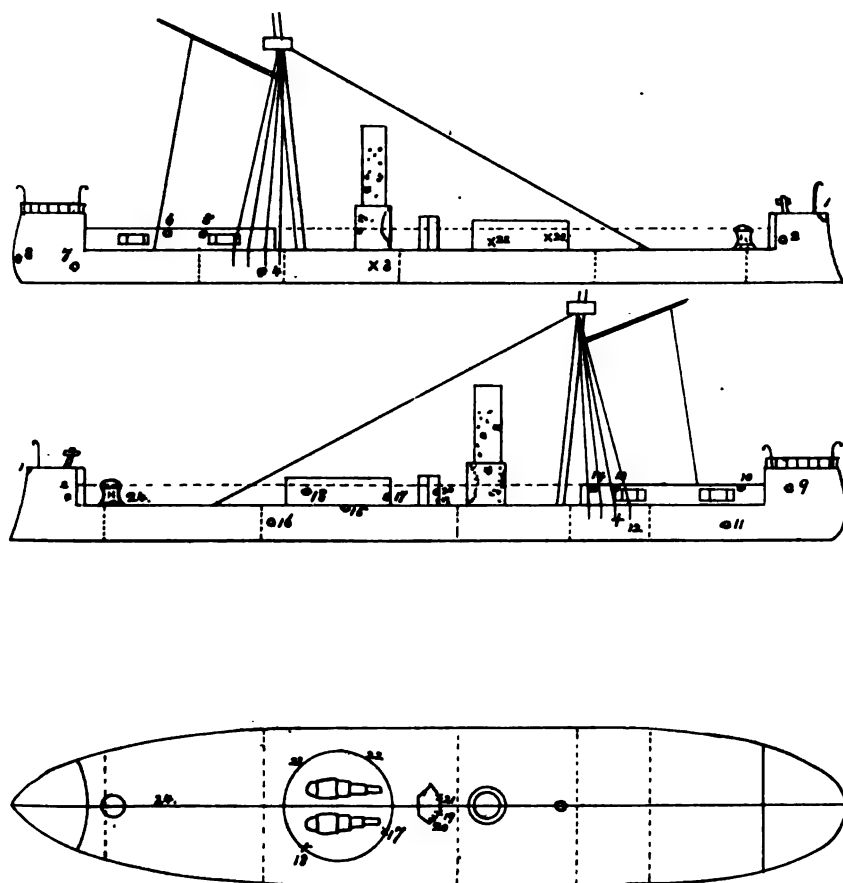
No. 24, Diagram A, struck the capstan, and, breaking the spindle, knocked the capstan overboard. The iron mast was penetrated at a height of some 20 feet above the deck by a projectile which made a hole about 4 inches in diameter on one side. There was apparently no injury to the small amount of rigging about this mast.

The mast or column supporting the standard compass on the poop was struck in two places, apparently by Nordenfelt projectiles, and the flag-staff at the stern was also shot away. Three of the four boat davits on the starboard side were destroyed, and the remaining one bent out of shape. The starboard boats are missing. The steam launch boiler stowed on the spar-deck was also demolished by projectiles during the action.

From the official reports it seems that the Almirante Cochrane was struck three times, suffering no material damage. The Blanco Encalada was not hit at all.



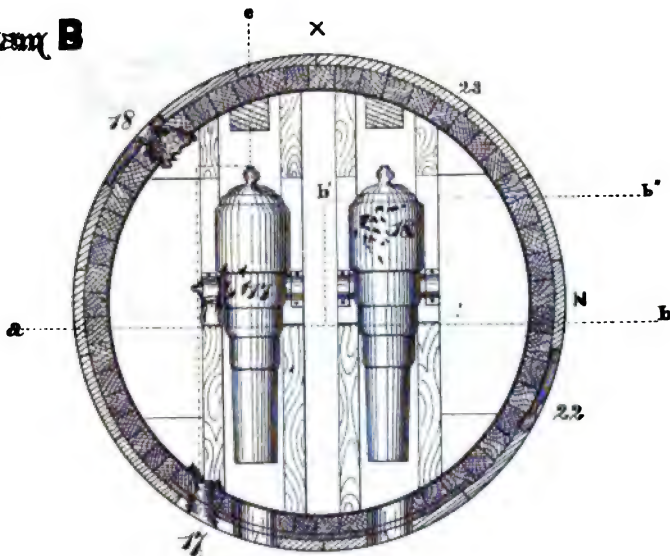
Diagram A.



*Plans of 'Huascar' showing
location of injuries received during
the action of October 8th 1879.*

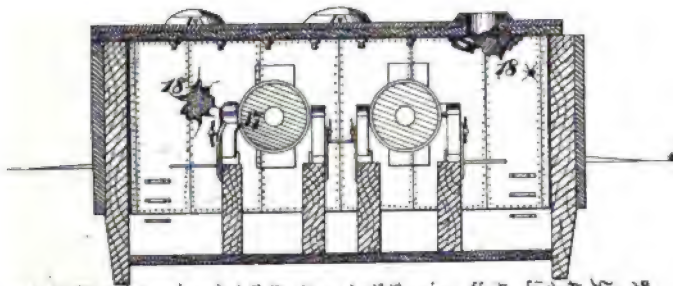
N. M. Ingersoll
Lieut. U.S.N.
det.

Diagram B



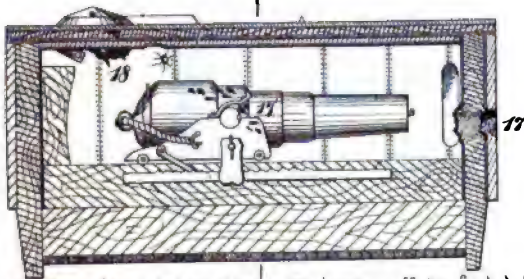
a Plan of Turret.

The injured plates are shown in section at point where struck.



Vertical Section through a.b. looking towards X, showing effect of shot No. 18.

The roof is through a.b. The injuries to the right transmission of right gun were caused by shot No. 17.



Vertical Section through c.d. looking towards X, showing effect of shot No. 17.

The injuries shown on the left were caused by shot No. 18.

T.B. M. S. 1888
Lond. U.S.A.
Ed.

Diagram C.

Sketches.

No. 1.

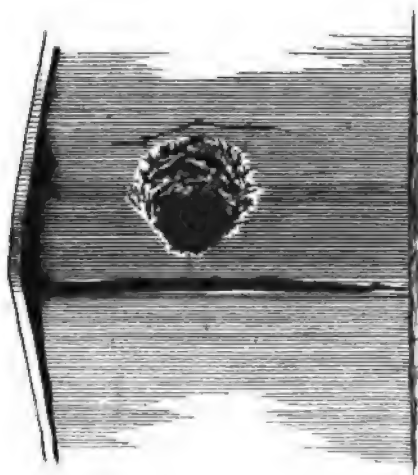


D. KENNEDY
Lieut. U.S.N.

Shot No. 17.

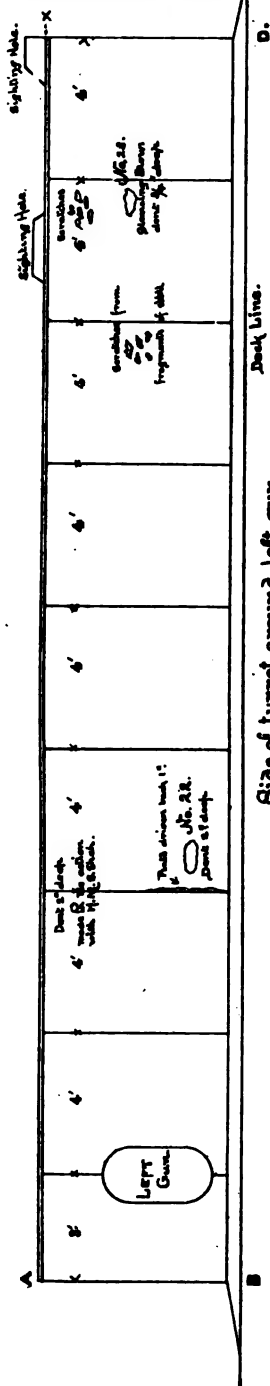
Turret of Houscar.

No. 2

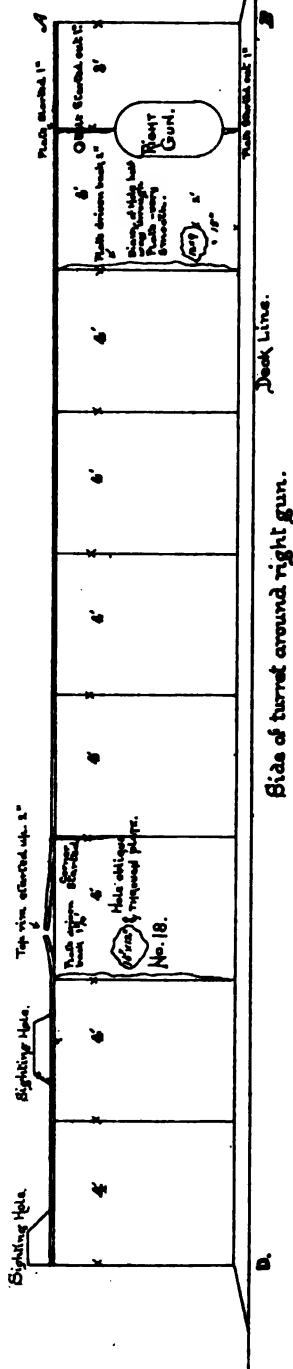


Shot No. 18.

Diagram C.



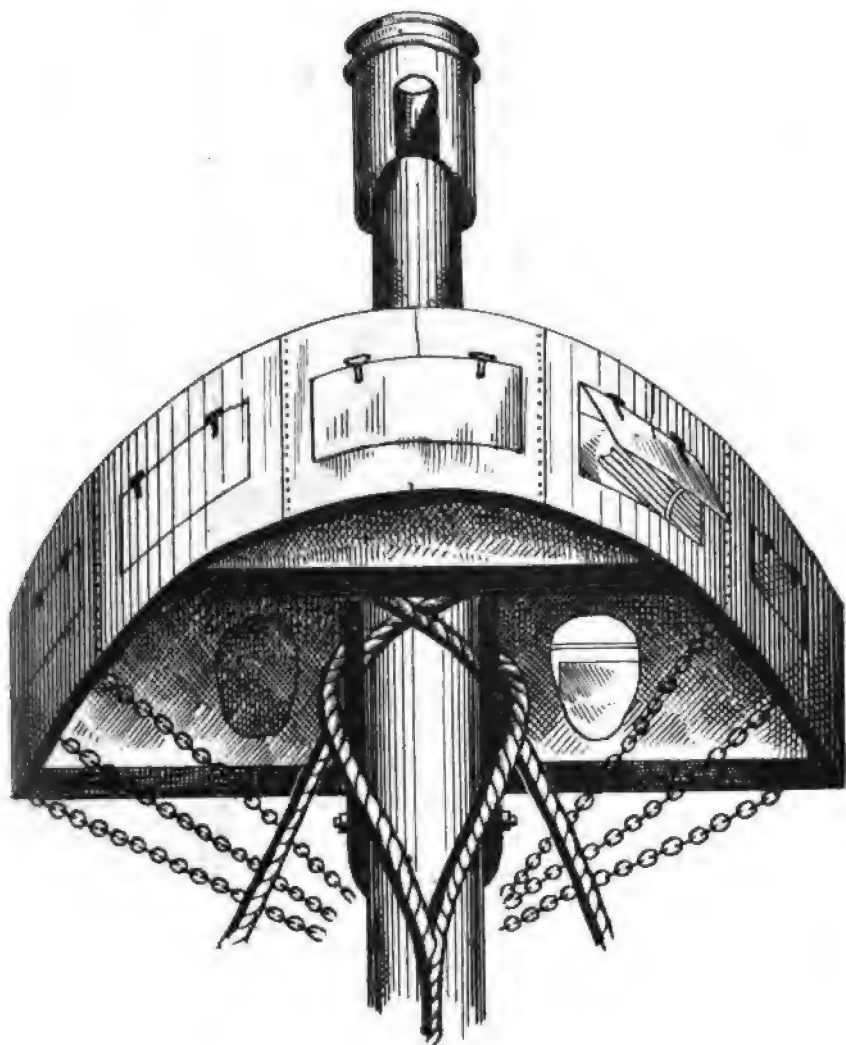
Side of turret around left gun.



Side of turret around right gun.

DEVELOPMENT of the TURRET of the 'HUASCAR',
Showing the injuries on the outside.
Shots, Nos. 16, 17, 18, 22 & 23.

Diagram D.
No. 1.

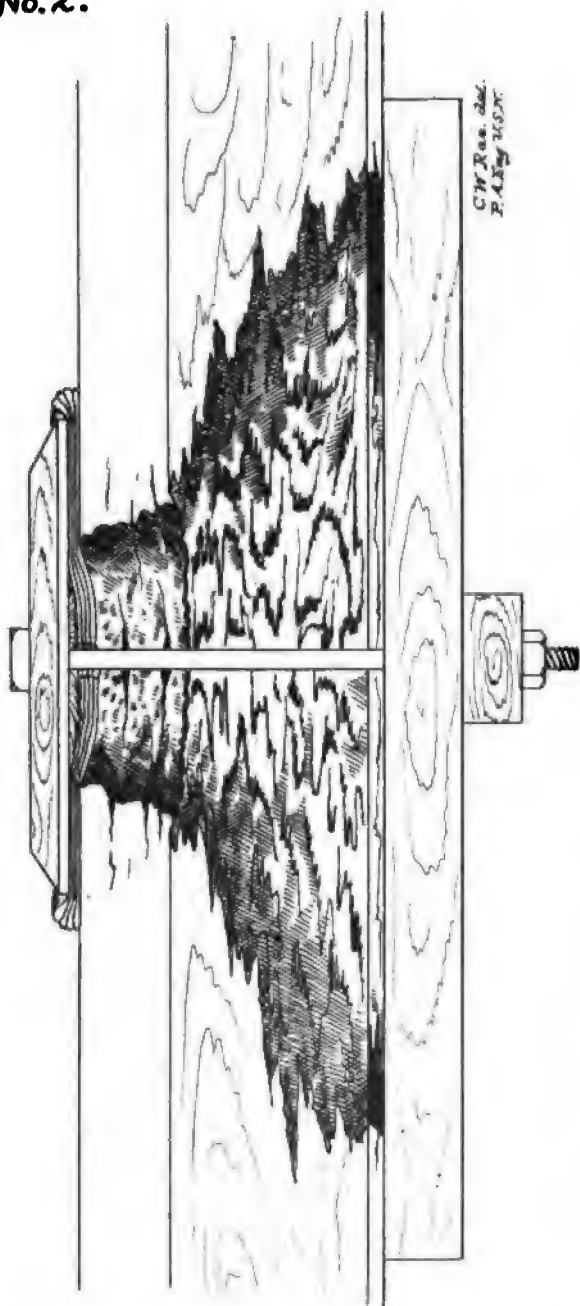


Crow's Nest, Main top of "Huascar."

Diagram D.

No. 2.

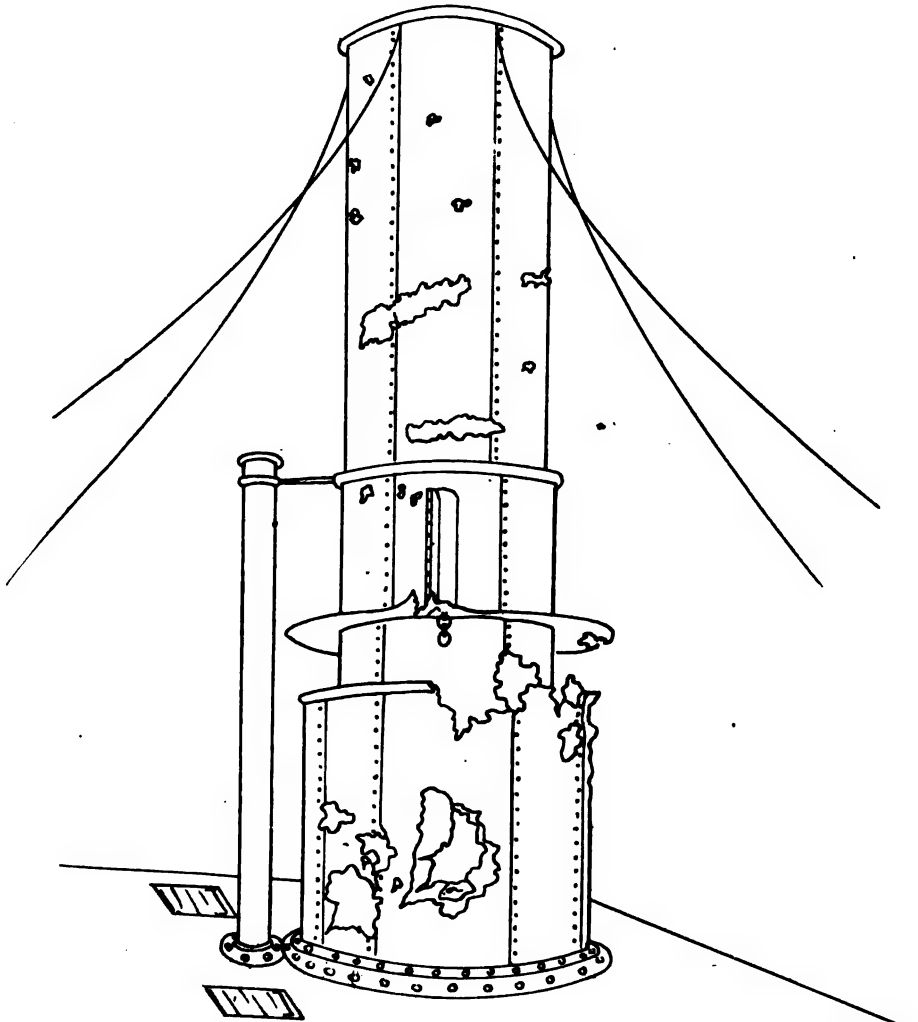
"Huascar". 1879.



Section through Side Armor showing method of plugging holes.

Scale = $\frac{1}{8}$

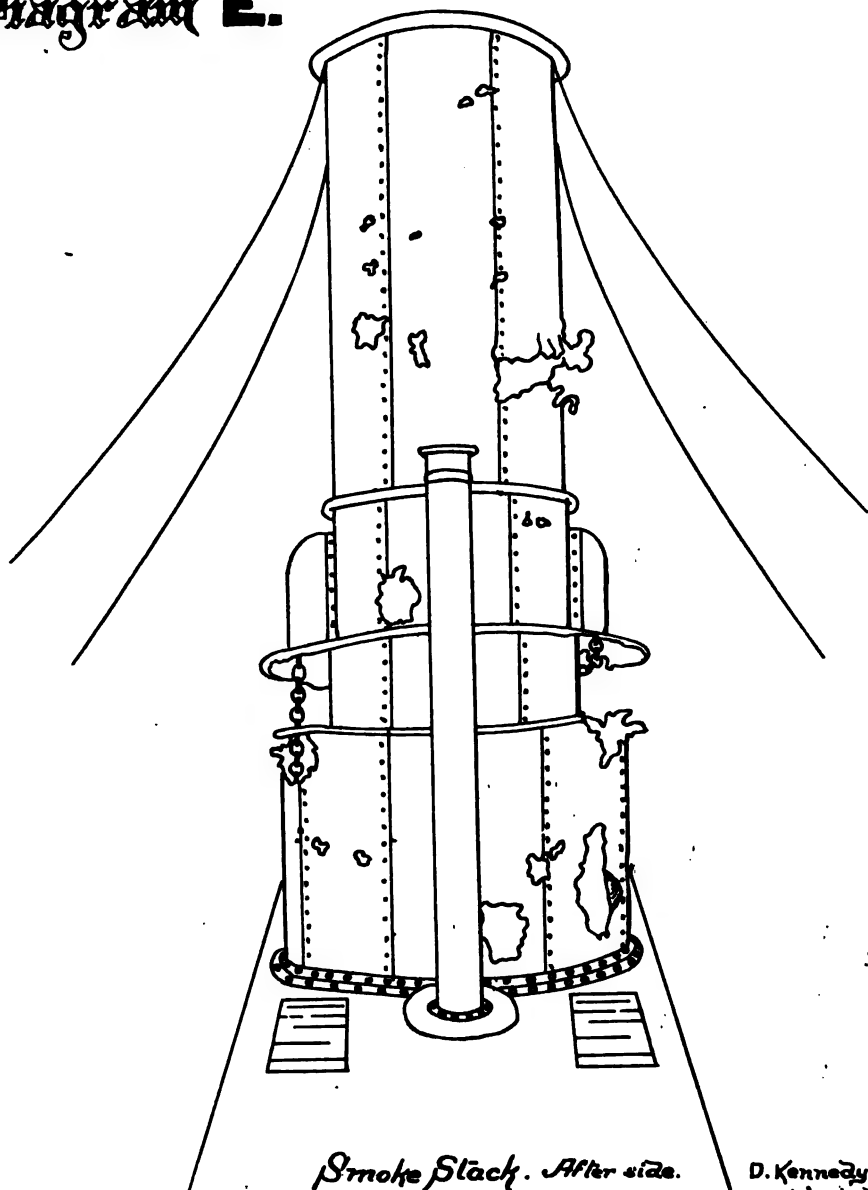
Diagram E.



*Smoke Stack, Bttd Side.
— "Hvascar" —*

*D. Kennedy
Lieut. U.S.N.*

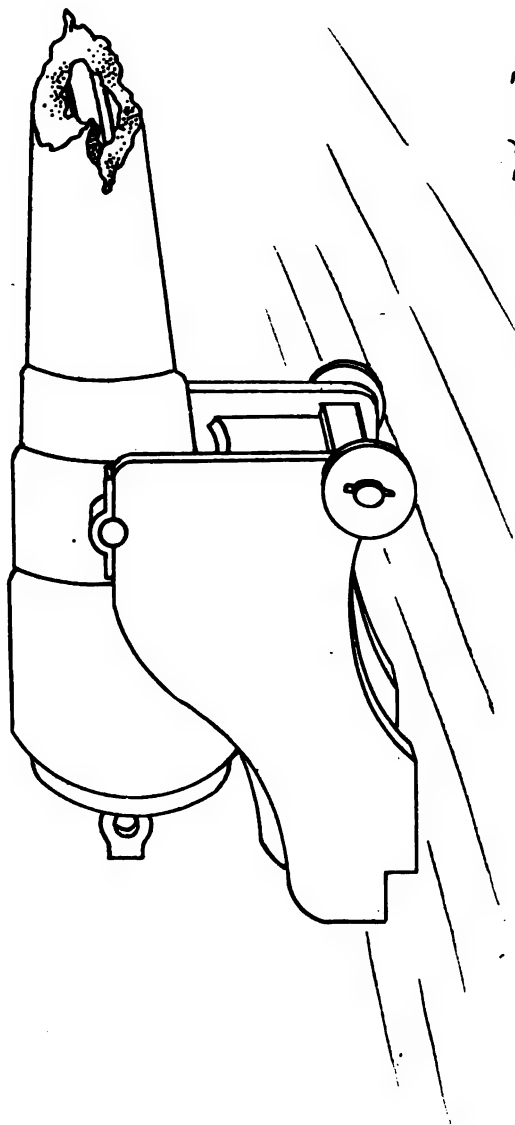
Diagram E.



Smoke Stack. After side.
HUASCAR.

D. Kennedy
Lieut. U.S.

Diagram F.

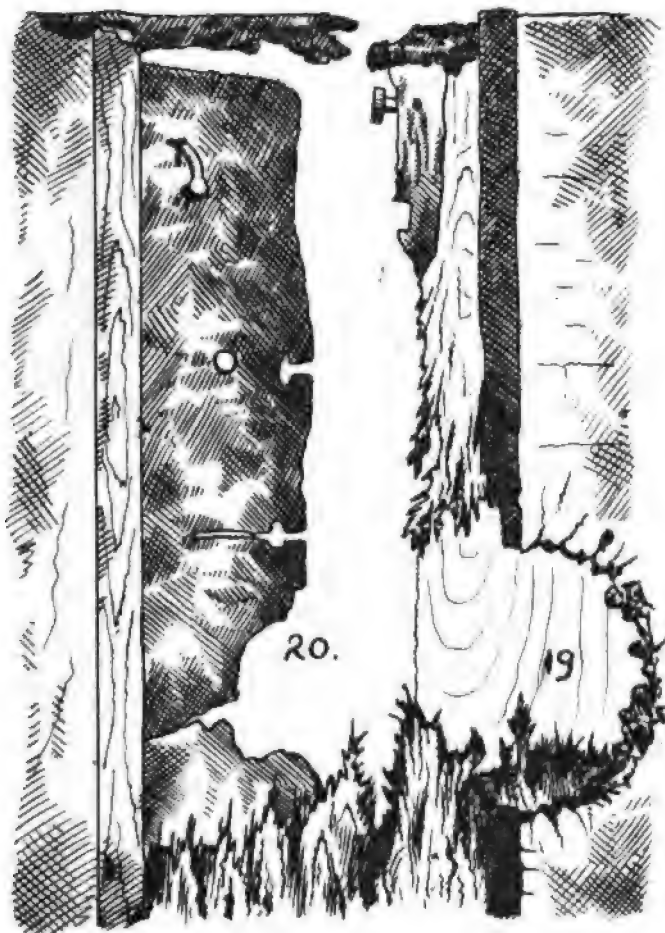


D. Kennedy.
Lieut. U.S.M.

ARMSTRONG 12-PDR. M.L.R.
"HUASCAR"
Shot, No. 13. Diagram.

Diagram G.
Sketch.

No. 1.



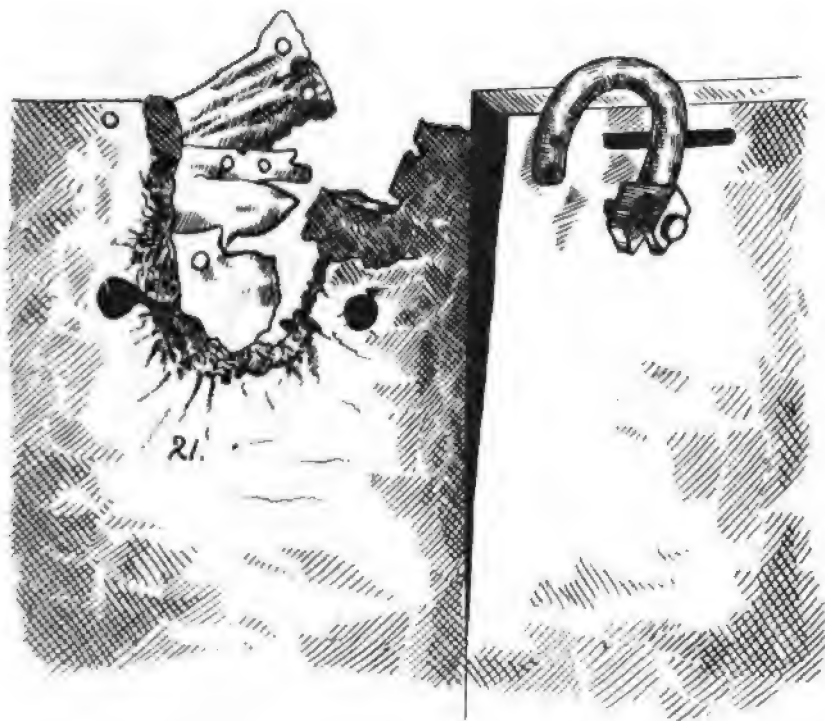
*Sketch of face E.D. Conning Tower.
after action of Oct. 8. 1879.
"Huascar."*

R. A. INGESELL.
Lieut. U.S.N.
det.

Diagram G.

Sketch.

No. 2.

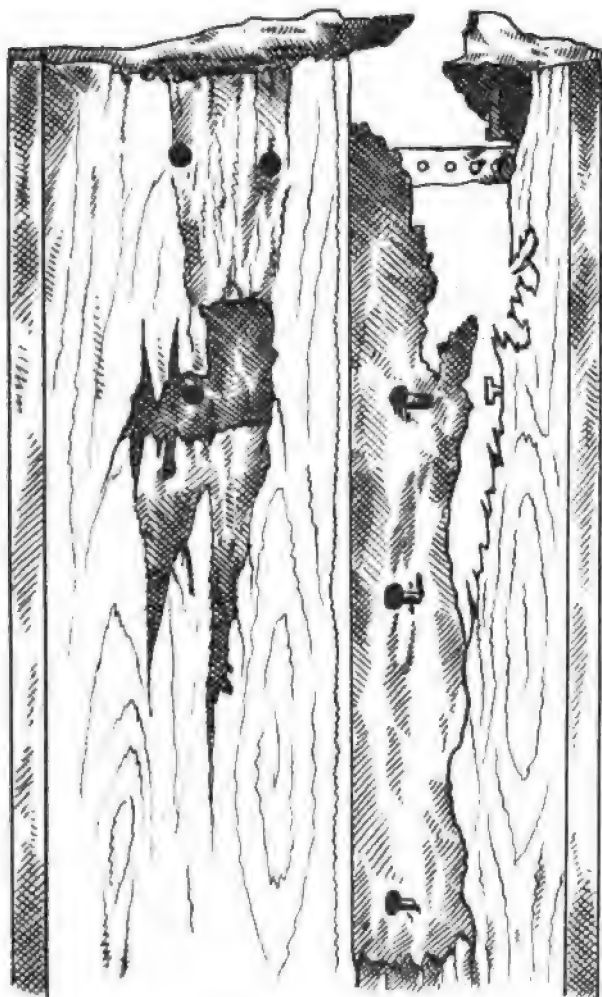


*Sketch of top of plates at angle C.
Conning Tower, "Huascar" Oct. 8. 1879.*

R. R. INGERSOLL
Lieut. U.S.N.
del.

Diagram G.
Sketch.

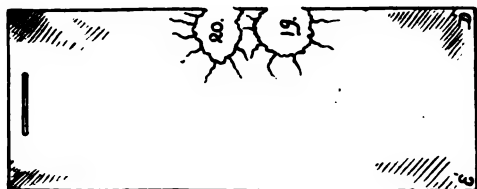
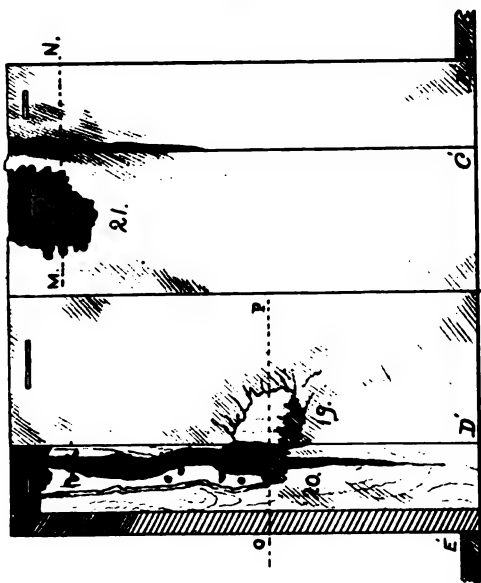
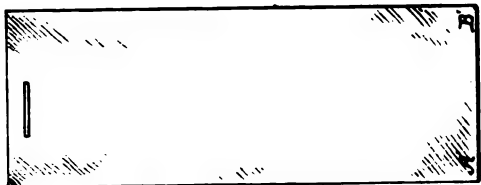
No. 3.



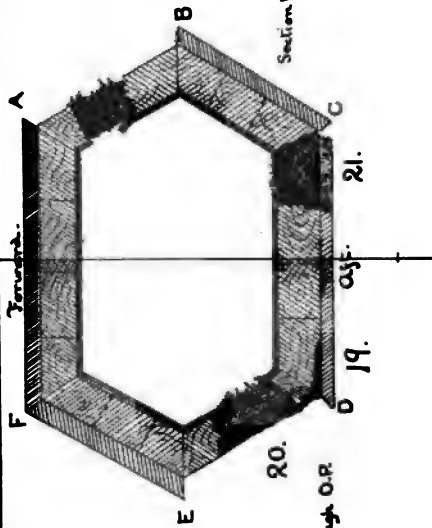
*Sketch of face A-B of Conning Tower
After Action of Oct. 8th 1879.
"Huascar."*

R. R. INGERSOLL.
Lieut. U.S.N.
det.

Diagram G.



CONNING TOWER.
"Huascar."
Condition after
action of Oct. 8th 1919.



Condition of face E.D.
Shown in Sketch, No. 1.

Condition of 1st of plates
at angle G shown in
Sketch No. 2.

Condition of face A.B.
Shown in Sketch, No. 3.

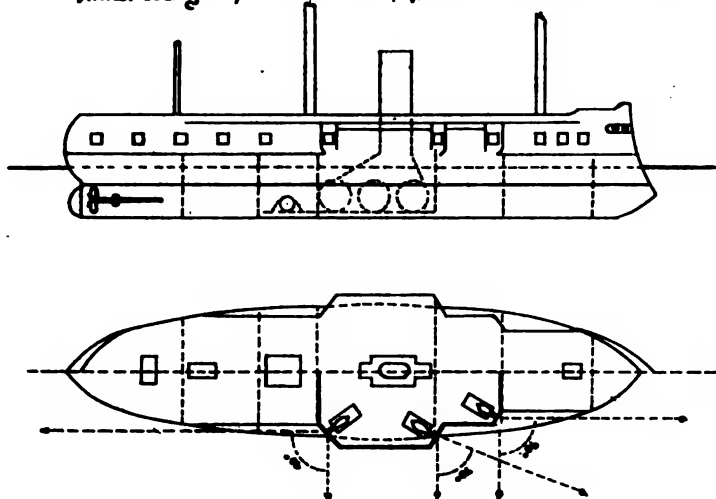
Section through M.N.

Section through O.P.

R. R. MORGAN,
Lieut. U.S.N.
det.

Diagram H.

America's Cochran and Blanco Encabada
 Length, 200 ft. Beam, 45' 9". Draught fore 15' 8", aft 14' 9". Height of
 battery, 5' 6". Displacement, 2860 tons. I.H.P. 2820. Maximum
 speed, 18 knots on trial trip. Battery 6 12 ton M.L.R. Armstrongs,
 1 inner over guns, 5". Inner belt, 9".



Huascar.
 Length, 146 ft. Beam, 35' 2". Draught, fore 15', aft 16'. Height of
 battery, 5'. Displacement, 1180 tons. I.H.P. 1200. Maximum
 speed, 13 knots on trial trip. Battery, 2, 300 per M.L.R. Armstrongs
 each. Inner on turret 5 1/2". Inner on sides, 4 1/2".

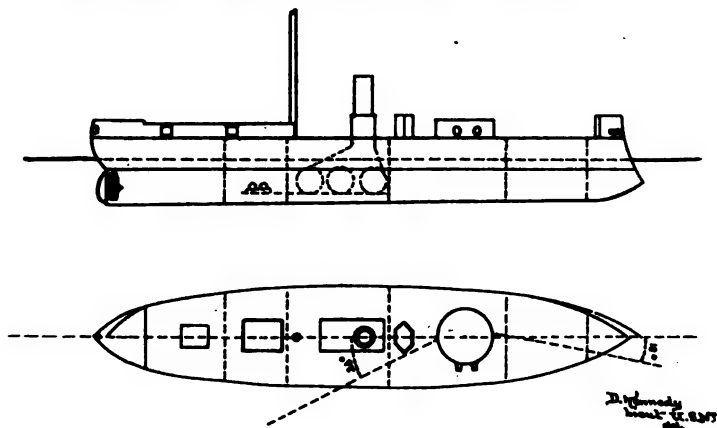
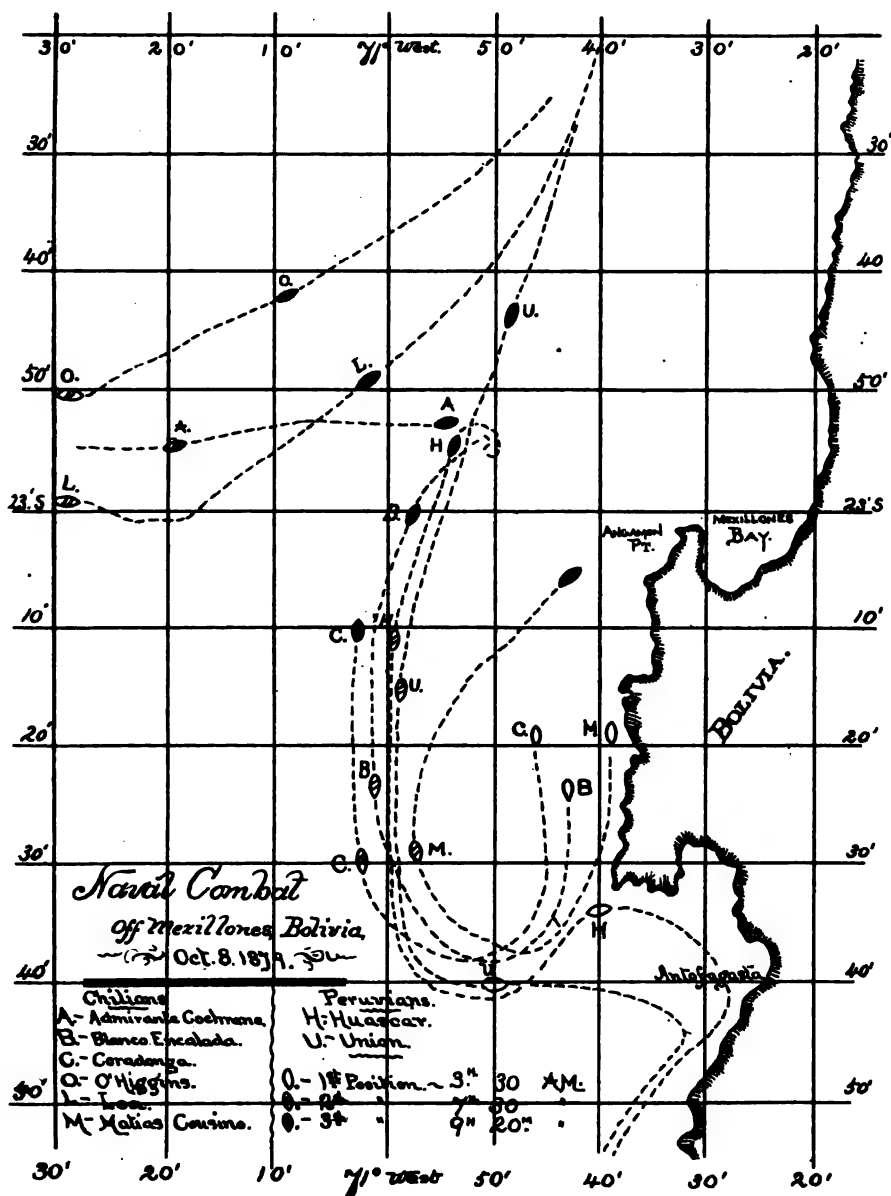


Diagram I.



T.B.M. Mason.
 Zint 28M.

Table showing description and number of projectiles fired by the vessels engaged, so far as reported.

	Three hundred-pounder Palliser, chilled armor-piercing shell; 50 pounds charge.	Two hundred and fifty-pounder Palliser, chilled armor-piercing shell; 50 pounds charge.	Twenty-pounder shell; 24 pound charge.	Nine-pounders.	Seven-pounders.	One-inch Nordenfolt.	Rifle-balls.
Almirante Cochrane.....		45	12		16	450	1,000
Blanco Encalada.....		31	6	4	2	350	1,000
Huascar.....	40 ±						
Total.....	40 ±	76	18	4	18	800	2,000

Total number of 250 pounders fired at the Huascar 76; of these those numbered 1, 2, 3, 4, 7, 8, 11, 12, 15, 16, 17, 18, 19, 20, 21, 22 and 24, are shown on Diagram A.

Shots numbered 7 and 8, Diagram A, disabled the steering gear and killed the people at the relieving tackles.

No. 16 entered the turret chamber, temporarily jamming the turret and killing the men at the revolving winch. Nos. 17 and 18 killed or wounded the crews in the turret, and killed the second and third officers in command. Nos. 19, 20, and 21 destroyed the conning-tower or pilot house, killed Admiral Grau, the commander, and his aid; and it is reported that the chain to the fighting wheel was injured, the wheel being directly under the conning-tower. No. 4 penetrated the engine-room, killing the people on the engine-room gallery; but it does not appear that any of the engineer's force were injured unless they were on the gallery. Nos. 3 and 12 glanced from abreast of boilers and engines. These eleven shots may be considered as the decisive ones of the action. All the Palliser shell which pierced the armor burst in the backing. Shot numbered 2, which passed through the fore-castle and bitts, did not burst.

The light guns and the Nordenfolt Gatlings, and Comblain rifles of the Chilians, cleared the men from the Huascar's top and drove the people from the spar-deck and guns. The Huascar when surrendered was temporarily disabled in her steering gear, the conning-tower completely destroyed, the crew driven from the spar-deck, and the principal officers and fighting part of the crew killed.

After the engagement, the Huascar was towed into the Bay of Mexico on account of her steering gear being disabled. The shot-holes in the hull, which admitted water when the vessel rolled, were then effectually patched by the Chilians, as follows: The patches were made of 2-inch oak plank, cut according to size of holes. Two or three thicknesses of blanket were placed between them and the armor-plating. A long bolt, passing through the center of each patch and through a piece of timber extending across the opening on the inside, was set up by a nut and made the patch secure. (See Diagram D, sketch No. 2.)

Twenty-four hours after the fight, the Huascar, in charge of a prize crew, commenced her voyage along the coast to Valparaiso, using her own motive power and without convoy. The tubes in one of the main

boilers were found to be leaking so badly that this boiler could not be used. It is supposed to have been caused by low water during the engagement. The bottom of the vessel was somewhat foul. For the purpose of comparing the relative powers of the vessels engaged in this combat, a description, marked B, and a diagram, marked H, of the sister ships *Almirante Cochrane* and *Blanco Encalada* are appended. A chart of the locality, with general course of the vessels during the chase, is appended and marked I.

Respectfully submitted.

K. R. BREESE,
Captain, U. S. N.
 E. D. ROBIE,
Chief Engineer, U. S. N.
 R. R. INGERSOLL,
Lieutenant, U. S. N.
 DUNCAN KENNEDY,
Lieutenant, U. S. N.
 THEO. B. M. MASON,
Lieutenant, U. S. N.

Rear-Admiral C. R. P. RODGERS, U. S. N.,
Commanding Pacific Station.

B.

ALMIRANTE COCHRANE AND BLANCO ENCALADA.

These two vessels are iron rams, built in England in 1874 and 1875, by John Penn & Son, after plans by Mr. E. J. Reed, and cost \$1,000,000 in gold each.

Length between perpendicular, 210 feet.

Breadth of beam, 45 feet 9 inches.

Draught forward, 18 feet 8 inches.

Draught aft, 19 feet 8 inches.

Height of battery, 5 feet 6 inches.

Displacement, 3,560 tons.

Indicated horse-power, 2,920.

Maximum speed, 13 knots.

The armament consists of six 12-ton Armstrong muzzle-loading rifles mounted in a central battery, so arranged that the forward gun on each side fires from right ahead to abeam; the midship one from 20° with the line of keel forward to abeam; and the after one from abeam to right aft. It is known also that each one of these vessels carries at least one 20 pounder, one 9-pounder, and one 7-pounder rifled gun. The *Blanco Encalada* carries two 1-inch $\frac{1}{2}$ -pounder Nordenfelt-Gatling guns, one on each end of the bridge, and the *Almirante Cochrane* carries one, mounted on the knight-heads. In addition to these light guns, in action picked riflemen are stationed in each top, and are protected from observation by canvas screens.

The battery is 7 $\frac{1}{2}$ feet high, and the armor is in two strakes, the lower of which is 8 inches thick and the upper 6 inches on the sides and forward part, while on the after part both have a uniform thickness of 4 $\frac{1}{2}$ inches.

The armor is backed with about 14 inches of teak, inside of which is a thin iron skin.

The transverse bulkheads forming the forward and after sides extend below the water-line.

The hull is divided into seven water-tight compartments by transverse iron bulkheads, and is protected around the water-line by an armor-belt 9 feet wide, in three strakes. The middle strake is 9 inches thick amidships, while the other two are 6, all of them tapering to a uniform thickness of $4\frac{1}{2}$ inches at bow and stern.

The teak-backing behind the armor-belt has an average thickness of 10 inches, and the whole of the armor and backing is fastened to a double thickness of skin plating supported by massive angle-iron frames on the inside and longitudinal angle-iron girders on the outside.

The upper deck, which is flush with the top of the armor-belt, is protected by 3 inches of armor near the central battery, and 2 inches at bow and stern.

These vessels have compound engines and twin screws; are reported to make 10 knots on a coal consumption of 30 to 35 tons per day; carry 254 tons of coal each, are bark-rigged, and carry 300 men. They have arrangements for firing their guns by electricity, and their steam launches have spar torpedoes.

At the time of the action, the *Almirante Cochrane* had recently had her bottom cleared and boilers put in good order, and, it is reported, was capable of steaming 11 knots.

The *Blanco Encalada* had a very foul bottom and boilers in poor condition, and it was difficult to maintain a speed of 8 knots.



REPORT
OF THE
POSTMASTER-GENERAL
OF THE
UNITED STATES;
BEING PART OF
THE MESSAGE AND DOCUMENTS
COMMUNICATED TO THE
TWO HOUSES OF CONGRESS
AT THE
BEGINNING OF THE SECOND SESSION OF THE FORTY-SIXTH CONGRESS.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1879.

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REPORT

OF

THE POSTMASTER-GENERAL.

WASHINGTON, D. C., *November 8, 1879.*

RECEIPTS AND EXPENDITURES.

SIR: The total expenditures of this department during the fiscal year ended June 30, 1879, were..... \$33, 449, 899 45

The revenues were as follows:

Ordinary receipts.....	\$29, 434, 648 43
Receipts from money-order business.	219, 226 83
Receipts from official stamps and stamped envelopes	388, 107 60
	30, 041, 982 86

Excess of expenditures over receipts.....	3, 407, 916 59
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Included in the above statement of receipts and expenditures is the sum of \$376,461.63 paid on liabilities incurred in previous fiscal years, and not properly chargeable to the expenditures of the last fiscal year. Deducting this sum from the aggregate amount leaves \$33,073,437.82 as the actual expenditures on account of service for the year.

The amount appropriated for service of the fiscal year 1878-'79, including sums appropriated by special acts, was.....	\$33, 828, 470 75
Amount expended for 1878-'79	33, 073, 437 82

Leaving an unexpended balance of appropriations for the year of.....	755, 032 93
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This balance will be largely reduced when the unadjusted liabilities for the year have been reported and paid.

Table No. 2 (page 268) accompanying the report of the Third Assistant Postmaster-General, shows the condition of the several accounts on the 30th of September, 1879.

The expenditures and receipts of the department, therefore, on account of and appertaining to the business of the last fiscal year, (ex-

cluding expenditures and receipts on account of previous fiscal years,) are as follows, viz :

Expenditures.....	\$33, 073, 437 92
Receipts, ordinary, from money-order business, and from official stamps.....	30, 041, 982 86

Leaving an excess of expenditures over receipts chargeable against the appropriations from the Treasury, hereinafter enumerated, of... 3, 031, 454 96

The expenditures during the fiscal year were \$801,209.77 less than those of the preceding year. This reduction is chiefly due to the change in the law regulating the compensation of postmasters, from commission on stamps sold to commission on stamps canceled.

The total receipts for the year were \$764,465.91, or 2.6 per cent., more than those of the preceding year, and \$1,007,884.58, or 3.4 per cent., more than the estimates therefor. The increase in the amount of revenue received over the amount estimated may be attributed, in a great measure, to the revival of business, resulting in an increased demand for postage-stamps, postal cards, &c., the sales of which amounted to \$769,481.87 more than for the last fiscal year, and \$2,387,559.23 more than for 1877.

The States returning revenues in excess of one million dollars were, New York, with \$5,710,310; Pennsylvania, \$2,732,593; Illinois, \$2,398,627; Massachusetts, \$2,087,228; Ohio, \$1,976,440; Missouri, \$1,124,555; and Michigan, \$1,004,487. Alaska foots the list with a revenue of \$53.

Excluding official postage-stamps and money-order receipts from both fiscal years, there is an increase of ordinary receipts over past fiscal year of \$671,703.27, or 2.3 + per cent.

The expenditures and receipts by fiscal quarters, and the increase or decrease therein, as compared with the corresponding quarters of 1876-'77 and 1877-'78, are shown by table No. 3 (page 270) which accompanies the report of the Third Assistant Postmaster-General.

AMOUNT DRAWN FROM TREASURY ON APPEOPRIATIONS.

The following amounts were drawn from the Treasury during the fiscal year on account of special and deficiency appropriations :

To supply deficiencies in the revenues for the year ended June 30, 1879, act of June 17, 1878.....	\$3, 000, 000 00
For transportation of the mails, railroads, for 1878, and previous years, act of March 3, 1879.....	166, 392 27
For transportation of the mails, deficiency, 1876, and previous years, act of March 3, 1879.....	45, 873 31
To pay George H. Giddings, late contractor, deficiency, 1876, and previous years, act of March 3, 1879.....	14, 583 33
To pay H. G. Boardman, postmaster at Milton, Vt., act of June 19, 1878.	116 34
For payment of increased salary to letter-carriers, &c., act of June 25, 1879.....	71, 000 00
	<hr/> 3, 297, 965 25

ESTIMATES FOR 1881.

The estimated expenditures for the fiscal year ending June 30, 1881, are.	\$39,920,900 00
The ordinary revenues are estimated at	\$32,000,000 00
Estimated revenue from money-order business.....	210,000 00

Total estimated revenue for the fiscal year ending June 30, 1881.	32,210,000 00
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Estimated excess of expenditures to be appropriated out of the general Treasury as a deficiency.....	7,710,900 00
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The item for official postage-stamps has not been stated separately in the estimates for 1880-'81, for the reason that the official (or penalty) envelopes are, in a large measure, taking the place of official stamps, and the estimated revenue from this source has been included in ordinary receipts.

Table No. 1 (pages 256-267), accompanying the report of the Third Assistant Postmaster-General, furnishes the estimates in detail.

DEFICIENCY APPROPRIATIONS.

The following statement shows the condition of the appropriations from the general Treasury to supply deficiencies in the postal revenues, viz :

1. For the fiscal year ended June 30, 1877, the amount undrawn and unexpended was \$167,498.00, which, by operation of laws, was carried into the surplus fund of the Treasury on the 30th June, 1879, leaving no means available for the payment of unsettled liabilities incurred prior to July 1, 1877.

2. For the fiscal year ended June 30, 1878, an additional deficiency appropriation of \$166,392.27 was made, which amount was drawn from the Treasury and placed to the credit of the Post-Office Department, for the payment of indebtedness on account of said fiscal year.

3. For the fiscal year ended June 30, 1879, the amount appropriated from the Treasury to supply deficiencies in the revenues was \$4,222,274.72, of which \$1,222,274.72 remains unexpended and available for unadjusted liabilities for said fiscal year.

LIABILITIES.

The unpaid indebtedness of the department for the fiscal year ended June 30, 1879, is estimated at \$713,344.45, for the payment of which there is available, as above stated, the sum of \$1,222,274.72.

The expenditures and receipts of the department and the condition of accounts will be found in detail in the report of the Auditor for the Post-Office Department, hereto annexed.

POSTAGE-STAMPS, STAMPED ENVELOPES, AND POSTAL CARDS.

The number of ordinary postage-stamps issued during the fiscal year was.....	774,358,780, valued at	\$20,117,259 00
Newspaper and periodical stamps.....	1,552,172, valued at	1,088,412 16
Special stamps for the collection of postage due under act of Congress approved March 3, 1879.....	15,667,600, valued at	365,957 00
Postal cards.....	221,797,000, valued at	2,217,970 00
Stamped envelopes, plain.....	80,806,700, valued at	2,160,417 92
Stamped envelopes, special-request.....	67,058,250, valued at	2,139,704 10
Newspaper wrappers.....	29,697,000, valued at	355,218 90
Official postage-stamps.....	14,201,822, valued at	624,999 95
Official stamped envelopes.....	17,209,150, valued at	469,011 90
Aggregating.....	1,222,348,474, valued at	29,538,950 93

INCREASE IN ISSUES OF POSTAGE-STAMPS, ETC.

Altogether there has been an increase in the aggregate value of the above issues over that of the issues for the previous fiscal year. There has been a decrease in several of the items, as shown in the following table:

Description.	Fiscal year ended June 30, 1878.	Fiscal year ended June 30, 1879.	Increase.	
			Value.	Per cent.
Ordinary postage-stamps.....	\$19,468,618 00	\$20,117,259 00	\$648,641 00	3.33
Newspaper and periodical stamps.....	1,088,845 30	1,088,412 16	*5,433 14	*.04
Postage-due stamps (first issue in the latter part of present fiscal year).....			365,957 00	
Postal cards.....	2,004,800 00	2,217,970 00	211,670 00	10.55
Stamped envelopes, plain.....	2,418,102 91	2,160,417 92	*257,684 99	*10.65
Stamped envelopes, special-request.....	2,183,025 25	2,139,704 10	*43,321 15	*1.98
Newspaper wrappers.....	304,645 60	355,218 90	50,573 30	16.60
Total increase, ordinary issues.....			970,402 02	3.53
Official stamps, stamped envelopes and wrappers.....	1,092,647 70	1,094,011 85	1,364 15	0.12
Aggregate increase.....			971,766 17	3.46

* Decrease.

In sending through the mails the supplies represented by the foregoing statements only five packages were lost.

POSTAGE ON NEWSPAPERS AND PERIODICALS.

The total amount of postage collected during the year on newspapers and periodicals mailed to subscribers from known offices of publication was \$1,104,184.67, or \$859,160.66 on 42,958,033 pounds of matter at 2 cents per pound, and \$245,024.01 on 8,167,467 pounds at 3 cents per pound. The increase in the amount of postage collected during the year on this class of mail matter over that for the previous year is \$79,003.69, which, in view of the reduction in the rate of newspaper and periodical postage, which took effect on the 1st of May last, under the act approved March 3, 1879, is a very gratifying increase.

DEAD LETTERS AND OTHER MAIL MATTER.

The total number of letters and parcels sent to the Dead-Letter Office during the year was 2,996,513, or 190,292 less than the receipts of the previous year. The reduction may be attributed to the increased efficiency of the delivery service, and the growing popularity of our peculiar return-request system, by which not only the undelivered letters mailed in "special-request" envelopes supplied by the department are returned to the writers direct, but those in envelopes bearing only a business card, the name and address of the sender, a street and number, a post-office box, or other indication of origin, are promptly returned to the owners without the intervention of the Dead-Letter Office.

The extent to which the people avail themselves of this privilege may be illustrated by the fact that there were mailed in a single day at the New York post-office 15,625 letters in the special-request envelopes furnished by the government, and 86,753 in envelopes supplied by private enterprise bearing name and address or other designation by which the writer could be identified.

For convenience in treatment the dead matter was separated into the following classes: Ordinary mailed letters, 1,876,702; drop or local, 382,100; of foreign address, 91,121; of foreign origin, 164,223; held for postage, 306,344; misdirected, 58,754; without any address whatever, 7,944; returned from hotels, 47,166; fictitious address, 17,544; third and fourth class matter, 28,684; and 5,976 registered letters.

The amount of money taken from letters which could not be restored to the writers, and deposited in the Treasury, was \$3,323.39.

The amount of postage collected upon short-paid matter forwarded to destination, and unclaimed articles of the third and fourth class returned to the senders, was \$4,471.70.

A statement of the contents and final disposition of letters and packages will be found in the report of the Third Assistant Postmaster-General, and tables submitted therewith, pages 289-293.

STATISTICS OF REGISTRATION.

The total number of letters and parcels registered during the year was 5,429,022; of which 4,227,079 were domestic letters; 203,497 domestic parcels of third and fourth class matter; 163,684 letters registered to foreign countries; 3,097 parcels of third and fourth class matter registered to foreign countries, and 831,665 letters and parcels of official matter forwarded for the government, and by law exempted from the payment of registry fees. The amount of registry fees collected during the year was \$459,735.70; an increase over the preceding year of \$44,736.40. The increase in the number of letters and parcels forwarded was 530,218. The value of the official matter forwarded under registration for the Post-Office and Treasury Departments aggregates the enormous sum of \$1,031,517,445.10. The extension of the registration system to arti-

cles of the third and fourth class of mail-matter has been received with great favor by the public. Out of 69,644 parcels of such matter registered at the New York City post-office, but five losses are reported, and these occurred on stage routes in the far West, and, upon investigation, may prove to have been simply delays occasioned by carelessness.

IMPROVEMENT OF THE REGISTRY SYSTEM.

Advantage was taken of the publication of a new edition of the postal laws and regulations to make a thorough revision of the registry system, by which its efficiency has been greatly increased. Distributing offices have been abolished, and all registered matter is now mailed direct to its destination; the through registered pouch system has been greatly extended; and all the blanks used for recording the registry business have been greatly simplified. The losses of registered matter during the year amounted to about one out of every seven thousand letters or packages forwarded.

STATISTICS OF TRANSPORTATION OF THE MAILS.

There were in the department on the 30th of June, 1879, 5,659 contractors for the transportation of the mails on public routes.

There were at the close of the fiscal year 1,948 special offices, each with a mail-carrier, whose pay from the department is not allowed to exceed the net postal yield of the office.

Of public mail-routes in operation there were 10,396 (of which 1,059 were railroad routes, being an increase of 59 routes of this class over the previous year), aggregating in length 316,711 miles; in annual cost, \$16,723,808. Adding the compensation of railway post-office clerks, route-agents, mail-route messengers, local agents, and mail-messengers, amounting to \$3,289,064, the aggregate annual cost was \$20,012,872.

The service was divided as follows:

Railroad routes: Length, 79,991 miles; annual transportation, 93,092,992 miles; annual cost, \$9,567,590; about 10.27 cents per mile.

Steamboat routes: Length, 21,240 miles; annual transportation, 5,091,474 miles; annual cost, \$754,388; about 14.81 cents per mile.

Other routes on which the mails are required to be conveyed with celerity, certainty, and security: Length, 215,480 miles; annual transportation, 69,248,339 miles; annual cost, \$6,401,830; about 9.24 cents per mile.

There were, at the close of the fiscal year, 4,465 offices supplied by mail-messengers, at an annual cost of \$664,174.

The railroad routes were increased in length 2,871 miles, and in cost \$995. This small increase in cost is owing to the reduction in the rate of pay under act of June 17, 1878.

The steamboat routes were increased in length 3,171 miles, and in cost \$1,905, and the "Star" routes 8,703 miles in length and \$686,887 in cost.

There was an increase over the preceding year in the total length of

routes of 14,745 miles; in annual transportation, 9,247,430 miles; and in annual cost, \$689,787. Adding the increase in cost for railway post-office clerks, route-agents, mail-route messengers, local agents, and mail-messengers, amounting to \$70,663, the total increase in cost was \$760,450.

COST OF RAILWAY SERVICE.

The cost of railway service on the 30th of June, 1879, was at the rate of \$9,692,590 per annum, an increase over the cost of the service during the preceding fiscal year of \$125,995. This increase does not, however, represent the actual rate of increase in the service, as account must be taken of the reduction of 5 per cent. in the rate of compensation from July 1, 1878, made under the act of June 17, 1878. The amount of this deduction is in round numbers \$400,000, making, with the \$125,995, an increase of \$525,995 for 1879 over 1878, being a little less than 5.5 per cent.

The general increase of business all over the country, and the reasonable certainty that the present prosperity will continue for some years to come, will require the appropriation for railway service to be increased at least 12 per cent. for the next fiscal year, and the estimate for that service is accordingly placed at \$10,000,000.

INCREASE OF RAILWAY POST-OFFICE LINES IN THE SOUTH.

The appropriation for railway post-office car service for 1880 is \$1,250,000. Under this appropriation new lines of postal cars have been established where they were most needed, especially in the Southern States, and the increase for the next fiscal year will not exceed 8 per cent. The estimate for this service for 1881 is therefore placed at \$1,350,000.

THE SPECIAL APPROPRIATION FOR PROPER FACILITIES.

The appropriation of \$150,000 to enable the Postmaster-General to obtain proper facilities for the prompt transmission of the mails by railroad companies has enabled the department to prevent injury to the service upon the most important lines by allaying the dissatisfaction of railroad companies at the general reduction of 10 per cent. and 5 per cent. additional upon their compensation; and has in several instances enabled the department to secure the running of special trains of great value to the business interests of the country. I would therefore recommend that this appropriation be renewed for the next fiscal year, and that the amount be increased according to the estimates submitted by the Second Assistant Postmaster-General.

TRANSFER OF MAILS FROM DEPOTS TO POST-OFFICES.

I desire again to call the attention of Congress to the importance of fixing the relative rights and duties of railroad companies and the department in regard to the transfer of mails from stations to post offices. Until this matter is settled upon an equitable basis it will be impossible properly to adjust the compensation of railroads for carrying the mail. It certainly seems an anachronism, to say the least, to expect because a

stage-coach can be driven without inconvenience 80 rods away from a turnpike to deliver mail at a post-office, that a railroad company should also be required to deliver mail to post-offices, when they happen to be within that distance of a station, without compensation therefor.

FAILURE TO OBTAIN STATISTICS FROM RAILROAD COMPANIES.

The act of March 3, 1879, provided: "That the Postmaster-General shall request all railroad companies transporting the mails to furnish, under seal, such data relating to the operating receipts and expenditures of such roads as may in his judgment be deemed necessary to enable him to ascertain the cost of mail transportation and the proper compensation to be paid for the same; and he shall in his annual report to Congress make such recommendations, founded on the information obtained under this section, as shall in his opinion be just and equitable."

In compliance with this direction letters have been addressed to railroad companies propounding a series of questions, the answers to which if truly given would enable the department to arrive at the cost and profit per linear foot per mile run of passenger-cars, which is believed to be a just and equitable basis upon which to fix the rates of pay for space used for carrying the mails and the postal employes engaged in their distribution. Very few companies have replied, and the pressure of current business has prevented the tabulation of the replies that have been received. Consequently no recommendation can be made.

TRANSCONTINENTAL AUSTRALIAN MAILS.

For several years this department has carried across the continent, between New York and San Francisco, a heavy British and Australian mail, at an annual cost of about \$100,000, for which no return had been received from Great Britain until the month of August, 1876, when, under the exceptional provision made in the Treaty of Berne for their lengthy and expensive railway service, special rates of territorial transit were agreed upon between this Department and the British Post-Office, which were considered sufficient to cover the actual cost of the railway transportation across our continent.

Through the efforts of the efficient representatives of this Department at the International Postal Congress, held at Paris in the spring of 1878, the exceptional character of the service rendered by this Department in transporting the closed mails between New York and San Francisco was reaffirmed in the Convention of Paris, and the British Government has already paid into the United States Treasury the actual cost of doing the work, which to this time amounts to something over a quarter of a million dollars. While this service does not appear as a credit to the item of railroad transportation, it is such in fact.

EXTENSION OF STAR SERVICE—A DEFICIENCY CREATED.

In consequence of the creation of new post-routes, upon which service was demanded by members of Congress, officers of the Army, and the

people of the sections interested, the star service has been extended to meet the necessities of the country. In so doing, an unavoidable deficiency of about \$150,000 has been incurred. To meet this there is a surplus in the appropriation for steamboat and railroad service of about \$250,000, and I would, therefore, recommend that the requisite amount be transferred from these appropriations to that for star service, thus obviating the necessity for a deficiency appropriation.

COMPENSATION FOR INCREASED SPEED AND INCREASED FREQUENCY OF STAR SERVICE.

The operation of the present laws regulating the increase of compensation for increased speed and increased frequency of service upon star routes results in great loss to the government. These laws (sections 3960 and 3961 of the Revised Statutes) have been in force for many years, and are the source of nearly all the deficiencies in the appropriations for star service which have ever been created. They are as follows:

SEC. 3960. Compensation for additional service in carrying the mail shall not be in excess of the exact proportion which the original compensation bears to the original service; and when any such additional service is ordered, the sum to be allowed therefor shall be expressed in the order, and entered upon the books of the department; and no compensation shall be paid for any additional regular service rendered before the issuing of such order.

SEC. 3961. No extra allowance shall be made for any increase of expedition in carrying the mail unless thereby the employment of additional stock and carriers is made necessary, and in such case the additional compensation shall bear no greater proportion to the additional stock and carriers necessarily employed than the compensation in the original contract bears to the stock and carriers necessarily employed in its execution.

It frequently happens, especially in the mining regions of the West, that, at the time of advertising, service is not required upon new routes more frequently than once or twice a week; but after the contracts have been made and service begun, population increases along the line, and an increase of speed and more frequent service become necessary. Under such circumstances it is clear that the rate that was reasonable for service once or twice a week, through a sparsely-settled region, becomes exorbitant when multiplied by three or six to cover daily service. I would, therefore, recommend that section 3960 be so amended as to permit the Postmaster-General to advertise for new proposals for the increased service, the contract to be awarded to the lowest responsible bidder, as usual. Section 3961 should be so amended that when the cost of increased speed would amount to more than 50 per cent. of the cost of the original service the Postmaster-General should readvertise for service at the increased speed.

INCREASE OF STAR SERVICE IN THE SOUTHERN STATES.

The estimates for star service for the next fiscal year contemplate a continuance of the present efficient service in other States, and largely increased mail facilities in the States of Indiana, Ohio, Kentucky, South

Carolina, North Carolina, Tennessee, Georgia, Florida, Mississippi, and Alabama. This service has already been advertised, the contracts to begin July 1, 1880.

FAST MAILS TO HAVANA AND SOUTH AMERICA.

The efforts of the department to establish a fast-mail service with Havana via Cedar Keys and Key West in order to meet the demands of commerce, have failed for several years on account of the insufficiency of the compensation allowed by law for such service. If the Postmaster-General were authorized to contract for service between Havana and the United States ports mentioned, at a sufficient rate of pay to secure the necessary speed and frequency, the commerce of the country would be greatly benefited. I believe that a general law should be passed authorizing contracts for carrying the mail between the United States and West Indian and South American ports, in American-built steamers carrying the American flag, at a fixed minimum and maximum price, the amount to be expended being regulated by the annual appropriations. Or the service might be thrown open to competition in the same manner as the star service. The adoption of such a policy by Congress would enable this country to control the profitable commerce with South America and the West Indies, which is now almost monopolized by Great Britain.

FINES AND DEDUCTIONS.

The amount of fines imposed upon contractors and deductions made from their pay for failures and other delinquencies for the fiscal year ended June 30, 1879, was \$177,098.57, and the amount remitted for the same period was \$16,571.76, leaving the net amount of fines and deductions \$160,526.81.

MAIL-BAGS AND CATCHERS.

From Table G of the report of the Second Assistant Postmaster-General (page 162), it will be seen that the total number of new mail-bags purchased under contract and put into service during the year was 104,021, of which 14,021 were locked pouches for first-class matter, and 90,000 were canvas sacks for second, third, and fourth class matter. This is an increase in the number of mail-bags issued of 24,123 over the previous year.

The number of new mail-catchers issued was 300.

The total expense of mail-bags and mail-catchers, including repairs, was \$170,266.26. The average annual cost of the last three preceding years was \$171,588.10.

The total number of mail-bags repaired was 356,527, and the total cost of their repairs was \$37,613.10. Under the old system of repairs the cost would have been \$80,338.29. In the last four years since the old system of repairs was abolished the total saving has been \$192,282.06.

MAIL LOCKS AND KEYS.

The total expense of mail locks and keys during the year was \$12,780.55; the average annual cost for the last three preceding years having been \$12,021.66. The term of all contracts for mail locks and keys expired during the preceding year, and supplies have been kept up during the past year by repairs and small purchases from the late contractors. The greater portion of the mail-locks now in use are nearly worn out and are becoming insecure from their long subjection to the peculiarly hard usage of the mail service. They were procured under contracts made in 1870, and as experience has shown that ten years is the limit of duration for mail-locks, their further use is not compatible with the requisite security. The locks used for through-registered pouches are also no longer adapted to the service. I would therefore earnestly recommend that provision be now made for superseding at the earliest possible date the locks now in use by those of new and improved patterns. In this connection reference is made to the report of the Second Assistant Postmaster-General (page 57).

READJUSTMENT OF COMPENSATION TO RAILROADS.

I desire to renew the recommendation of my last report for the passage of a law readjusting the compensation of railroads for carrying the mail upon the basis of space, speed, and frequency, supplemented by the weight of mails carried. This would enable the department to designate every railroad in the country by name as a railway post-office line, which they all are now in fact. The only reason why they are not all so called is because section 4004 of the Revised Statutes allows additional pay for post-office cars, and to so designate all railroads would increase the annual expenditure, under the present basis of compensation, by over a million dollars; and hence the anomaly is presented of railway post-office lines which furnish apartments in cars only 10 feet 2 inches long by 6 feet 6 inches in width, and of route-agent lines upon which entire cars are furnished 55 feet long and 8 feet 9 inches wide, in both of which precisely the same work of distributing the mails is carried on.

RAILWAY POST-OFFICE LINES.

A tabular statement (I, page 164) hereto appended, shows that the number of railway post-lines in operation on the 30th of June, 1879, was 59, extending over 17,340 miles of railroad routes, an increase of 360 miles as compared with the preceding year.

The number of clerks in the service at the end of the fiscal year ending June 30, 1878, was 1,081, whose annual salaries aggregated \$1,260,590.

The number of clerks in the service at the end of the fiscal year ending June 30, 1879, was 1,091, whose annual salaries aggregated \$1,272,290, showing an increase of 10 clerks and of \$11,700 in salaries.

The annual miles of service performed by railway post-office clerks, route-agents, and mail-route messengers was 52,419,773. (See Table K, pages 168-213.)

CLASSIFICATION OF EMPLOYÉS OF THE RAILWAY MAIL SERVICE.

I most earnestly renew my recommendation of last year for the reclassification of the employés of the railway mail service as advised by the general superintendent of that service. No additional expense will be incurred, but the business of the department will be greatly facilitated and much annoyance will be spared to the appointment office which is now caused by the necessity of transferring employés from one class to another in order to avoid exceeding the appropriation. The railway mail service is the most important branch of the postal system. Under a judicious system of appointments and a tenure of office dependent upon merit alone, its efficiency has developed so that the enormous amount of 2,648,661,550 pieces of mail-matter were distributed by it during the past year with only one mistake in the disposition of each 3,469 pieces. The work performed by all the employés is the same, varying only in amount, and yet under the present mode of appropriating for postal clerks, route-agents, mail-route messengers, and local agents, two men working in the same car and performing the same service frequently receive a different salary simply because one is paid out of the appropriation for route-agents and the other out of that for postal clerks. This is the greatest evil now existing in the service and it can be completely remedied by the classification of the employés as recommended.

POST-ROUTE MAPS.

The work of preparing and keeping up the post-route maps has been continued in the topographer's office during the past year, rendering essential aid to the officers and employés of the department, particularly to those of the railway mail service, in a proper understanding of the requirements, actual and prospective, for the speedy distribution of the mails. These maps are also in great request by the other departments of the public service.

During the past year, besides successive editions of previously issued maps, new maps of the States of Minnesota, South Carolina, and Georgia, Arkansas, and the Indian Territory have been completed, and a map of Dakota Territory is nearly ready. New maps of Louisiana and of the Pacific States and Territories are required, and will be designed to take the place of the provisional copies hitherto in use.

The publication is desirable of an extended table of distances for use in the settlement of mileage and telegram accounts referred to the topographer by this and other departments for his certificate, for the compilation of which the force at his disposal is not sufficient.

The work of this office is necessarily increasing with the extension of

the mail-service, and I have, therefore, in my present estimates, requested a somewhat larger appropriation than that for the past year.

OPERATIONS OF SPECIAL AGENTS.

The duties of the special agents of this department in exercising surveillance over the hundred thousand persons who are legally entitled to have access to the mails have been performed with great efficiency. Robbery of the mails and stealing the postal revenues by employes of the department cannot escape detection and punishment, and the general knowledge of this fact should greatly assist postal employes to resist temptation.

A system of thorough inspection of post-offices by special agents, embracing the solvency of the postmaster's bond, the organization of his office and the manner of conducting it, condition of accounts and government property, etc., has been perfected to the great advantage of the service.

SPECIAL AGENTS SHOULD BE STYLED INSPECTORS OF POSTS.

I recommend that the designation of the officers known as special agents be changed to inspectors, as more appropriate and less liable to confusion with others in public and private employment. This title is given to similar officers in the postal service of other countries. It should be borne in mind that the duties of these officers are by no means confined to the detection and arrest of offenders against the postal laws. On the contrary, most of their time is occupied in the inspection of the postal service, the examination of postmasters' accounts, the investigation of the solvency of their bonds, the collection of debts due the department by postmasters, and the general supervision of all officers and employes of the postal service.

ARRESTS AND CONVICTIONS OF OFFENDERS AGAINST POSTAL LAWS.

The number of persons arrested during the year was 552, of whom 459 were prosecuted in United States courts and 93 in State courts. Of the former, 191 were convicted, 11 acquitted, 10 escaped, 39 proceedings were dismissed, 2 forfeited bail, and 206 await trial. There were 45 highwaymen arrested for mail-stage robberies, the prosecution of 42 being in United States courts and 3 in State courts. The arrests are classed as follows:

<i>Subject to jurisdiction of United States courts.</i>	
Postmasters	46
Assistant postmasters	22
Clerks in post-offices	15
Postal clerks and route-agents	10
Letter-carriers	11
Mail-carriers	17
Other employes	8
Highwaymen	42
Burglars	83
All others for various offenses	205

Subject to jurisdiction of State courts.

Highwaymen	3
Burglars	55
All others for various offenses	35
	<hr/> 552

CASES ACTED UPON BY SPECIAL AGENTS.

The number of cases made up for investigation by special agents during the year was 23,242, classified as follows :

Registered cases, class A.—2,759.—Registered letters reported lost, 2,109, of which 1,995 contained cash, \$21,790.07; 114 contained money-orders and exchange, \$35,697.05. Of this number, 1,120 were recovered, viz, 1,067 containing 53 money-orders and exchange to the value of \$10,872.21, and cash \$9,873.59; reported rifled of contents, 578, containing cash \$8,080.10. Of this number, investigation proved 121, alleged to contain \$1,751.09, to have been falsely reported. Reported tampered with, 72, containing \$1,144.33, of which 47, said to contain \$910.85, were erroneously reported. The disbursements of moneys collected and recovered, on account of lost and rifled registered letters, amounted in 566 cases to \$16,952.85, of which amount \$7,554.79 was paid in 260 cases of loss occurring in this year, and the remainder, \$9,398.06, in 306 cases of previous years.

Ordinary cases, class B.—15,261.—Ordinary letters reported lost and rifled, 14,538, of which 5,802 contained cash \$40,056.78; 1,353 money-orders and exchange, \$453,947.96, and 7,383 contents not specified. Of this number, 1,480 were recovered, viz: 397 containing cash \$2,942.02; 184 containing money-orders and exchange \$49,619.99, and 899 contents not specified. The disbursements of moneys collected and recovered on account of lost ordinary letters amounted, in 126 cases, to \$719.49, of which amount \$177.75 was paid in 17 cases of loss occurring in this year, and \$541.74 in 109 cases of previous years.

Robberies of mail-stages on the highway, 50; robberies of post-offices, 98; burning of mail, 4; and charges of depredation against postmasters, 246.

Miscellaneous Cases, Class C.—5222.—This class comprises failing contractors, defaulting postmasters, change of postmasters, solvency of sureties of postmasters, inspection of post-offices, post-routes, and forgery of money-orders.

POST-OFFICES ESTABLISHED AND POSTMASTERS APPOINTED.

The report of the Appointment Office shows the following :

Number of post-offices established during the year	2, 676
Number discontinued	1, 079
Increase	1, 597
Number in operation June 30, 1878	39, 958
Number in operation June 30, 1879	40, 855
Number filled by appointment of the President	1, 711
Number filled by appointment of the Postmaster General	39, 144

Appointments were made during the year—

On resignations and commissions expired.....	5,627
On removals	558
On changes of names and sites	187
On deaths of postmasters	378
On establishment of new post-offices	2,676

Total appointments	9,426
Number of cases acted on during the year	10,778

NUMBER OF SPECIAL AGENTS AND EMPLOYÉS OF THE RAILWAY MAIL SERVICE.

The number and aggregate compensation of special agents, railway post-office clerks, route-agents, mail-route messengers, and local agents in service during the year ended June 30, 1879, were—

* 45 special agents	\$145,122 64
1,091 railway post-office clerks	1,272,290 00
1,143 route agents	1,072,420 00
241 mail-route messengers	167,649 00
134 local agents	112,531 00
	<hr/> 2,770,012 64

EMPLOYÉS IN THE POST-OFFICE DEPARTMENT.

The following table shows the number of employés in the Post-Office Department; also, the number of postmasters, contractors, clerks in post-offices, railway post-office clerks, route-agents, and other officers in service June 30, 1878, and June 30, 1879:

	1878.	1879.
Departmental officers and employés:		
Postmaster General.....	1	1
Assistant Postmasters General	3	3
Superintendent of money-order system	1	1
Superintendent of foreign mails	1	1
Chief clerk to the Postmaster-General	1	1
Chiefs of divisions	4	5
Topographer for department	1	1
Disbursing officer and superintendent of building	1	1
Law clerk		1
Stenographer	1	1
Appointment clerk		1
Superintendent of blank agency		1
Chief clerks of bureaus	5	5
Clerks, messengers, watchmen, &c.....	354	391
	<hr/> 373	<hr/> 414

Postmasters and other officers and agents:

Postmasters	39,258	40,855
Contractors	5,996	5,659
Clerks in post-offices	4,651	4,694
Letter-carriers	2,275	2,359
Railway post-office clerks	1,081	1,091

* Other special agents charged to separate appropriations.

	1878.	1879.
Postmasters and other officers and agents—Continued.		
Route-agents	1, 143	1, 143
Mail-route messengers	241	241
Local agents	143	134
Special agents	59	54
Total in service	55, 220	56, 544

CLERKS IN POST-OFFICES.

The increasing demands of the postal service call for a large increase in the appropriation for the payment of clerks in post-offices. The estimate for this item is greatly below the actual needs of the service. I have so estimated, however, because I did not desire to increase the growing disparity between the revenues and expenditures of the department. To provide a less sum for the employment of clerks than I have estimated for will cripple the work of post-offices, and in many instances delay the transmission of the mails. Many localities can now be mentioned where an insufficiency of clerical force retards the dispatch of the mails; and, in fact, nearly all complaints of delays are traceable to the inability of postmasters to properly handle the enormous amount of matter deposited in and passing through their offices.

THE FREE-DELIVERY SYSTEM.

The increase in the appropriation for the free-delivery system during the last fiscal year was only \$50,000 over that of the preceding year. It enabled the department to partially provide for the increased demands of the service in some of the large cities, but it was not sufficient to justify a considerable extension of the system. New service was, however, established at Oakland, Cal., at a cost during the year of \$3,272.01. The remainder of the \$50,000 increase of appropriation, to wit, the sum of \$46,727.99, was expended in the employment of additional carriers in the large cities and the incidental expenses connected therewith.

POSTAGE ON LOCAL MATTER.

The postage on local matter during the last year exceeded that of the preceding year in the sum of \$360,272.35, and it also exceeded the entire cost of the free-delivery service in the sum of \$864,771.14. Much of the increase in the amount derived from local postage is believed to have come from the extension of the territorial limits supplied by carriers in several of the large cities.

The increase in postage on local matter in the free-delivery cities last year was 14.74 per cent.; the increase in the cost of the service during the same period was only 6.34 per cent.

The average cost per piece of handling local matter was 2.40 mills, or a reduction of .10 of a mill as compared with last year, although the average cost per carrier (attributable to the increase of compensation provided in the act of February 21, 1879) was \$24.27 in excess of the previous year.

Very little complaint of the frequency of the service or of the man-

ner of performing it has reached the department of late. It may be said to have attained great success. With larger appropriations more frequent deliveries could be secured, and such improvement would meet with universal commendation in the larger cities.

AN INSUFFICIENT APPROPRIATION FOR LETTER-CARRIERS.

After the passage of the act of February 21, 1879, and in accordance with its provisions, the free-delivery cities were divided into two classes. Those with populations exceeding seventy-five thousand were placed in the first class, and those with smaller populations in the second class. In cities of the first class the pay of carriers was also classified under said act; one-half of the carriers employed therein being paid at the rate of one thousand dollars per annum, the other half at the rate of eight hundred dollars per annum. The pay of carriers in cities of the second class was fixed at eight hundred and fifty dollars per annum.

To meet the cost of thus increasing the compensation of carriers the sum of \$71,000 was appropriated. It proved, however, to be insufficient. In the attempt to comply with the law the appropriation was unexpectedly exceeded in the sum of \$1,706.61, and the discovery of the fact was not made until the payments for the month of May were completed. No payment of the additional compensation to carriers provided by the act referred to was made for the month of June, and that sum is still due. I have, therefore, to recommend that a deficiency of \$23,706.61 be provided for, \$22,000 thereof to be expended in payment of the amount due carriers for the month of June, as before stated, and the remainder to cover the deficiency mentioned above.

STATISTICS OF THE FREE-DELIVERY POST-OFFICES.

The aggregate results for the fiscal year were as follows:

AGGREGATE RESULT OF FREE-DELIVERY SERVICE FOR THE FISCAL YEAR ENDED JUNE 30, 1879.

		Increase over last year.	Decrease over last year.	Per cent. of increase.
Number of offices	88	1		1.13
Number of carriers	2,359	84		3.56
Mail letters delivered	213,996,862	10,534,334		4.92
Mail postal cards delivered	40,299,460	6,422,304		15.90
Local letters delivered	64,710,184	7,229,057		11.19
Local postal cards delivered	31,904,474	2,709,864		8.49
Registered letters delivered	1,410,044	117,600		8.34
Newspapers delivered	102,365,370	10,437,360		10.19
Letters collected	253,174,241	37,125,400		14.66
Postal cards collected	62,130,798	15,298,583		24.62
Newspapers collected	39,862,632	4,297,413		10.77
Whole number of pieces handled	809,854,065	94,071,915		11.61
Pieces handled per carrier	339,060	24,431		7.20
Total cost of service, including pay of special agents	\$1,947,706 61	\$123,585 76		6.34
Average cost per piece in mills	2.40		.10	
Average cost per carrier*	\$823 34	\$24 27		2.74
Amount of postage on local matter	\$2,812,523 86	\$300,272 35		12.94
Excess of postage on local matter over the total cost of service	\$864,771 14	\$236,686 59		37.69

* Based on the aggregate (\$1,942,261.15) paid carriers, including incidental expenses at the several offices, less \$5,445.46 paid special agents.

NUMBER OF DOMESTIC MONEY-ORDER OFFICES.

At the commencement of the last fiscal year the total number of post-offices authorized to issue and pay domestic money-orders was 4,143. During the year 400 new offices were added to the list and 31 were discontinued, making the total number of such offices in operation on the 30th day of June, 1879, 4,512.

ISSUES AND PAYMENTS OF DOMESTIC MONEY-ORDERS.

During the year 6,372,243 domestic money-orders, amounting to \$88,254,641.02, were issued, and 6,360,611, amounting to \$87,427,047.26, were paid. The amount of such orders repaid during the same period was \$579,152.94, which, added to the amount of the orders paid, makes the payments amount to \$88,006,200.20. The excess of the issues over the payments was \$248,440.82.

The fees received by postmasters for the issue of domestic money-orders amounted to \$798,625.65. The average amount of such orders issued was nearly \$13.85, being about 66 cents less than the average of the preceding year, and the average fee received for each order was 12.53 cents, being 0.21 less than the average of the preceding year.

Of the total amount of orders paid, about \$41,325 were orders issued to the War Department for payment of claims for bounty and back pay due by the United States to colored soldiers for services during the late war. These orders were all transmitted to the postmaster by whom payable through the office of the superintendent of the money-order system, and with them were transmitted certain blank forms supplied by the War Department and relating to the claims, which it was made the duty of the paying postmaster to cause to be properly filled out and duly signed. As, by request of the War Department, these orders were only to be paid to the payees named in the corresponding advices, and were not, like other money-orders, to be transferable by endorsement, they often gave rise to considerable correspondence, and in all cases entailed extra labor upon the respective postmasters, for which they received no additional compensation.

INCREASE IN THE MONEY-ORDER BUSINESS.

By the foregoing statement, when compared with that relating to similar transactions of the previous year, an increase of \$6,812,276.15, or 8.36 per cent., is shown in the amount of the orders issued; of \$6,655,592.06, or 8.24 per cent., in the amount of the orders paid; and of \$83,364.45, or 11.65 per cent., in the amount of fees received.

REVENUES AND EXPENSES OF THE MONEY-ORDER SYSTEM.

The Auditor has reported the following statement of revenue which accrued from domestic money-order transactions during the fiscal year ended June 30, 1879 :

Fees received on domestic money-orders issued.....	\$798, 625 65
Premiums, &c.....	721 44
Total.....	799, 347 09
Commissions and clerk hire.....	\$512, 550 52
Incidental expenses.....	31, 946 76
Lost remittances.....	4, 364 50
Bad debts.....	26, 524 54
Net revenue.....	223, 960 77
	799, 347 09

The revenue, \$223,960.77, from the domestic business is \$21,008.40 greater than that of the previous year, being an increase of 10.35 per cent.

Allowances for clerk hire amounting to \$177,439.00 were made during the last year at several of the larger post-offices out of the surplus commissions accruing from their money-order business over and above such amount of commissions as, when added to the postmaster's salary, would make his entire compensation \$4,000 per annum, the limit fixed by law.

The allowances are made at such offices in lieu of commissions when the exigencies of the service require additional clerical labor, and are included in the foregoing statement of the Auditor, in the item of "commissions and clerk hire."

REMITTANCES OF SURPLUS FUNDS.

During the past fiscal year the aggregate amount of surplus money-order funds accruing at the smaller post-offices and remitted by them to the larger post-offices, designated as their depositories, was \$54,266,677.08.

LOST REMITTANCES.

In the last annual report it was stated that nine cases, amounting to \$1,320.00, of remittances alleged to have been lost in the mails, remained unsettled June 30, 1878. The amount involved in these cases, however, as since ascertained, should have been reported as \$1,323.00; and there were two cases, amounting to \$502.50, which occurred prior to June 30, 1878, but were not brought to the attention of the department until after the close of that fiscal year, making the total number of unsettled cases eleven and the amount involved \$1,825.50. During the year ended June 30, 1879, in thirty-two cases remittances amounting to \$6,698.00 were reported as lost, making a total of forty-three cases, amounting to \$8,523.50, giving rise to investigation by the department.

Of this amount, \$3,589.50 were allowed to the postmasters who made the remittances; \$1,235.00 were recovered by special agents in the service of the department; \$760.00 were charged to the remitting postmasters; and, pursuant to act of Congress approved June 14, 1878, the loss of four remittances, amounting to \$487.00, burned with the mail-car en route January 7, 1875, was assumed by the department.

Ten cases of remittances, amounting to \$2,452.00, remained unsettled at the end of the fiscal year.

The discrepancy of \$775.00 between the amount, \$3,589.50, reported above as allowed to postmasters on account of remittances lost in the mails, and the amount, \$4,364.50, reported by the Auditor as so allowed, is owing to the fact that a credit of \$775.00 was authorized by this department during the year ended June 30, 1877, which was not settled by the Auditor until after the commencement of the succeeding year.

TRANSFER OF MONEY-ORDER FUNDS AND DRAFTS.

In case of money-order offices at which the amount required to pay orders when presented is either habitually or occasionally in excess of the amount received from the sale of orders and from depositing post-offices, postmasters are authorized to make transfers of funds from their postage account to their money-order account to meet the deficiency arising from such excess in the payments.

In cases where the amount of postage funds was insufficient or not available for this purpose, postmasters at offices east of the Rocky Mountains were allowed a definite amount of credit with the postmaster at New York, N. Y. Drafts amounting to \$8,295,931.50, against credits so allowed, have been paid by the postmaster at New York, N. Y., during the last fiscal year.

To meet similar requirements in the States and Territories of the Pacific slope, where drafts upon New York are not at all times available, postmasters were furnished with funds, amounting to \$144,750, by the postmaster at San Francisco, Cal., and \$20,910 by the postmaster at Portland, Oreg.

At certain post-offices, where large sums are required to meet payments of mail-contractors and other creditors of the department, the transfer of funds from the money-order to the postage account is, when necessary, specially authorized by the department.

The transfers from the money-order to the postage account during the last year amounted to \$462,658.48, and from the postage to the money-order account to \$654,229.71, leaving a balance of \$191,571.23 to the credit of the postage account.

MONEY-ORDERS ERRONEOUSLY PAID.

In the last annual report it is stated that claims for reimbursement on account of the alleged erroneous payment of thirty-one money-orders, amounting to \$587.15, remained unsettled at the close of the year. Since the end of the period to which that report refers, additional cases of twenty-one orders, amounting to \$401.90, alleged to have been erroneously paid prior to July 1, 1878, have been brought to the notice of the department.

Sixty-two orders, amounting to \$1,676.34, were alleged to have been erroneously paid during the year, being at the rate of 1 erroneous payment in 102,591 orders paid, making a total of 114 alleged erroneous payments, amounting to \$2,665.39, under investigation during the year.

Nine of these orders, amounting to \$203.33, were afterward ascertained to have been paid to the proper person; in case of twenty-eight orders the whole amount, \$746.30, was recovered by special agents of this department. In case of four others, amounting to \$50.85, the loss was assumed by the department; the amount of forty-three orders, \$1,111.04, was charged to the paying postmaster, or through him to the clerk in his office through whose negligence the error occurred; in case of eleven orders the payee was required to sustain the loss, \$222, and the cases of nineteen orders, amounting to \$331.87, remained unsettled on the 30th of June, 1879.

DUPLICATE MONEY-ORDERS.

The total number of duplicate money-orders issued was 18,975, being an increase of 2,399 over the number of such orders issued during the previous year. Of this number 17,304 were issued in lieu of orders lost in the mails, or which, by reason of imperfect address or change of residence, or from some unknown cause, had failed to reach the payee; 906 were issued in lieu of orders alleged to have been lost through the negligence or misfortune of the remitters, payees, or indorsees; 255 were issued to remitters in lieu of orders payment of which had been prohibited in pursuance of section 3929 of the Revised Statutes of the United States, because drawn in favor of the proprietors or agents of fraudulent lotteries, gift enterprises, or other "schemes or devices for obtaining money through the mails by means of false or fraudulent pretenses, representations, or promises"; 91 in lieu of orders which had become invalid by reason of having received more than one indorsement; 304 in lieu of orders invalidated because not presented for payment within one year after the date of their issue, and 115 in lieu of orders mutilated or rendered illegible while in the hands of remitters, payees, or indorsees.

INTERNATIONAL MONEY-ORDER BUSINESS—REVENUES AND EXPENSES.

The Auditor has not reached a final adjustment of the accounts of the last quarter of the fiscal year, required to be made with the proper accounting officers of the several foreign countries with which money-order conventions are in force. For this reason he is unable, at this time, to furnish an exact statement of the revenue for the year derived from the exchange of money-orders with those countries.

The revenue and expenses for the year ended June 30, 1878, as stated by the Auditor in the case of each of the foreign countries named, are given below under the appropriate heading.

EXCHANGE OF MONEY-ORDERS WITH SWITZERLAND.

At the commencement of the last fiscal year 180 money-order offices were in operation authorized to issue orders payable in Switzerland, and to pay orders drawn in that country. Three offices were added to the list during the year, making a total of 183 in operation at its close.

The number of such orders issued in the United States during the year was 5,135, amounting to \$96,171.25, of which amount \$459.13 was afterward repaid to the remitters, and the number paid in the United States was 2,010, amounting to \$55,829.99.

The fees received for Swiss orders issued amounted to \$2,758.50.

A comparison of this business with that of the previous year exhibits an increase of \$3,890.51, or 4.21 per cent., in the amount of orders issued; of \$2,034.27, or 3.78 per cent., in the amount of orders paid; and of \$462.25, or 20.13 per cent., in the amount of fees received. The Auditor's statement of the Swiss revenue and expense account for the year ended June 30, 1878, is as follows:

Fees received	\$2,635 25
Paid for commissions and clerk hire.....	\$778 44
Paid for incidental expenses	1 99
Excess of commissions paid Switzerland	371 27
Cost of exchange.....	549 39
Net revenue.....	934 16
	<hr/> 2 635 25

EXCHANGE OF MONEY-ORDERS WITH GREAT BRITAIN.

At the commencement of the last fiscal year 1,014 money-order offices were in operation authorized to issue orders payable in the United Kingdom of Great Britain and Ireland, and to pay orders drawn in that country. Eight offices were added to the list during the year, and one was discontinued, leaving a total of 1,021 in operation at its close.

The number of such orders issued in the United States during the year was 64,310, amounting to \$894,859.25, of which amount \$2,242.07 was afterward repaid to the remitters, and the number paid was 19,740, amounting to \$345,761.09.

The fees received for orders issued amounted to \$27,753.

A comparison of this business with that of the previous year shows an increase of \$87,675.93, or 10.86 per cent., in the amount of the orders issued, a decrease of \$17,442.09, or 4.80 per cent., in the amount of the orders paid; and an increase of \$2,677.25, or 10.67 per cent., in the amount of fees received.

The Auditor's statement of the revenue and expense account with Great Britain for the year ended June 30, 1878, is as follows:

Amount received for fees on orders issued.....	\$25,075 75
Net loss.....	10,175 22
Total	<hr/> 35,254 57
Amount paid for commissions and clerk-hire	\$21,351 22
Amount paid for incidental expenses	200 96
Excess of commissions paid	4,435 58
Cost of exchange	9,266 81
	<hr/> 35,254 57

EXCHANGE OF MONEY-ORDERS WITH GERMANY.

At the commencement of the last fiscal year 659 money-order offices were in operation authorized to issue orders payable in the German

Empire, and to pay orders drawn in that country; and 14 offices were added to the list during the year, making a total of 673 in operation at its close.

The number of such orders issued in the United States during the year was 47,342, amounting to \$829,788.36, of which amount \$3,630.34 was afterward repaid to the remitters; and the number paid was 25,462, amounting to \$639,542.68.

The fees received for orders issued amounted to \$22,927.

A comparison of this business with that of the previous year exhibits an increase of \$46,371.52, or 5.92 per cent., in the amount of orders issued, a decrease of \$27,270.02, or 4.09 per cent., in the amount of orders paid and an increase of \$1,316.50, or 6.09 per cent., in the amount of fees received.

The Auditor's statement of the revenue and expense account with Germany for the year ended June 30, 1878, is as follows:

Amount received for fees on orders issued	\$21,610 50
Amount paid for commissions and clerk hire	\$11,834 78
Amount paid for incidental expenses	58 47
Excess of commissions paid Germany	1,805 19
Cost of exchange	2,501 67
Net revenue	5,410 39
	<hr/>
	21,610 50

EXCHANGE OF MONEY-ORDERS WITH CANADA.

At the commencement of the last fiscal year 375 money-order offices were in operation, authorized to issue orders payable in the Dominion of Canada, and to pay orders drawn in that country. No new offices were added to the list during the year.

The number of such orders issued in the United States during the year was 16,231, amounting to \$316,283.98, of which amount \$966.42 was afterward repaid to the remitters; and the number paid was 20,757, amounting to \$339,072.45.

The fees received for orders issued amounted to \$7,217.80.

A comparison of this business with that of the previous year exhibits an increase of \$56,901.55, or 21.93 per cent., in the amount of orders issued; a decrease of \$112.44, or 0.03 per cent., in the amount of the orders paid, and an increase of \$1,163.30, or 19.21 per cent., in the amount of fees received.

The Auditor's statement of the revenue and expense account with Canada for the year ended June 30, 1878, is as follows:

Amount of fees received on orders issued	\$6,054 50
Excess of commissions received	406 76
	<hr/>
Total	6,461 26
Amount paid for commissions and clerk-hire	\$5,417 04
Amount paid for incidental expenses	995 85
Net revenue	48 37
	<hr/>
	6,461 26

EXCHANGE OF MONEY-ORDERS WITH ITALY.

At the commencement of the last fiscal year 142 money-order offices were in operation, authorized to issue orders payable in the Kingdom of Italy, and to pay orders drawn in that country. One office was added to the list during the year, making a total of 143 in operation at its close.

The number of such orders issued in the United States during the year was 4,070, amounting to \$103,352.11, of which amount \$140 was afterward repaid to the remitters; and the number paid was 349, amounting to \$10,040.69.

The fees received for orders issued amounted to \$2,760.25.

A comparison of this business with that of the previous year exhibits a decrease of \$2,181.42, or 2.06 per cent., in the amount of orders issued; an increase of \$2,169.57, or 27.81 per cent., in the amount of the orders paid, and a decrease of \$56.25, or about 2 per cent., in the amount of fees received.

The Auditor's statement of the revenue and expense account with Italy, for the year ended June 30, 1878, is as follows:

Amount of fees received on orders issued.....	\$2,816 50	
Net loss.....	948 04	
		<hr/>
Total.....		3,764 54
Amount paid for commissions and clerk-hire.....	\$598 41	
Amount paid for incidental expenses.....	28 60	
Excess of commissions paid Italy.....	962 58	
Cost of exchange.....	2,174 95	
		<hr/>
		3 764 54

GENERAL FINANCIAL RESULTS OF THE MONEY-ORDER BUSINESS.

The gross number of domestic and international money-orders issued during the year was 6,519,331, amounting to \$90,495,095.97; and the gross number paid, 6,428,929, amounting to \$88,817,294.16.

The net revenue derived from the transactions of the domestic money-order business is \$223,960.77, as reported by the Auditor, without taking into account the additional expenses, paid out of appropriations, hereinafter to be mentioned.

In addition to the expenses enumerated in the foregoing statement made by the Auditor, the following items of expense, amounting to \$210,665.56, which are fairly chargeable to the money-order system, were paid out of general appropriations, viz: Salaries to 30 employes in the Superintendent's office, \$40,100; salaries to 101 employes in the money-order division of the Auditor's office, \$116,280; books, blanks, and printing furnished for the money-order system by the Public Printer, \$49,285.56; and books, blanks, and stationery not included in the last item, estimated at \$5,000. After deducting the above-enumerated items of expense from the total net revenue, stated as above at \$223,960.77,

there remains an absolute net profit to the credit of the system amounting to \$13,295.21 in excess of all legitimate expenses.

The sum of \$219,226.83, being the net proceeds of the domestic money-order business for the fiscal year ended June 30, 1879, less the loss on account of the international business for the previous year, as reported by the auditor, has been deposited with the Treasury Department to the credit of the United States for the service of the Post-Office Department. The sum of \$191,571.23, due the postage account, by reason of the excess of transfers, heretofore mentioned, from that account to the money-order account, has been paid over.

FOREIGN MAILS.

The total weights of the mails dispatched from the United States to countries of the Universal Postal Union (the Dominion of Canada excepted) during the year were as follows: Letters, 102,980,282 grams, equal to 3,632,910 ounces; printed matter and samples of merchandise, 444,141,226 grams, equal to 15,668,291 ounces, being an increased weight over 1878 of 232,199 ounces of letters, and 1,139,429 ounces of printed matter and samples. A statement is appended of the weight of mails dispatched to each postal union country. (Pages 405-409.)

The number of letters exchanged with other countries not embraced in the Universal Postal Union, the Dominion of Canada excepted, was 685,188, of which number 396,915 were sent to and 288,273 received from such countries.

COST OF OCEAN MAIL SERVICE.

The payments made during the fiscal year 1879 for the sea conveyance of United States mails amounted to \$198,908.06, being an increase of \$1,631.91 over the amount paid for the same service during 1878. Of this sum \$153,749.64 was paid for the trans-Atlantic service, \$11,004.39 for the trans-Pacific service, and \$34,154.03 for the service to Canada, the West India Islands, Mexico, Central American and South Pacific States, Venezuela, Honduras, Brazil, and Uruguay.

The particulars of these several services are appended to this report, page .

The additional sum of \$28,053.47 was recognized and paid for the Atlantic transportation of British closed mails from New York to England from January 1, 1877, to September 30, 1878, and credit claimed therefor by this department in the quarterly accounts with the British office. Adding to this sum the payments made on account of the United States ocean service, the total amount paid during the year to the different lines of ocean mail steamers, for transportation of mails to foreign countries was \$226,961.53.

The aggregate amount of the quarterly balances paid to the United States during the year on the settlement of the postage accounts with countries of the Universal Postal Union was \$54,469.30, and the aggre-

gate amount of the quarterly balances paid by the United States to the same countries was \$38,275.79.

The sums paid to this department by other postal union administrations on account of the United States sea and territorial transit of open and closed mails amounted to 514,633.53 francs (\$101,675.39); and the sums paid by this department to other postal union administrations for the foreign sea and territorial transit of United States mails amounted to 257,291.39 francs (\$50,429.11).

UNIFORM RATES OF POSTAGE TO ALL COUNTRIES OF THE UNIVERSAL POSTAL UNION.

The ratifications by the United States of the Universal Postal Union Convention were duly exchanged at Paris on the 26th February, 1879, and its provisions were carried into operation on the 1st of April, 1879, superseding from that date the general postal union treaty concluded at Berne, October 9, 1874.

Article 5 of the Paris Convention establishes general rates of postage throughout the entire extent of the Universal Postal Union, with authority, however, to levy additional charges for the correspondence subjected to the sea-transit rates of 15 francs per kilogram of letters and postcards, and 1 franc per kilogram of other articles; but as the correspondence sent from the United States to distant countries and colonies of the union to which these sea-transit rates are applicable, constitute a very inconsiderable part of the mail matter sent to postal union destinations, I deemed it expedient, in view of the desirability of fixing uniform postage rates, to waive the right to levy additional charges upon the correspondence addressed to such countries and colonies; and accordingly issued an order directing the regular rates of union postage to be levied and collected in the United States on all correspondence exchanged within the Universal Postal Union (Canada excepted), without regard to distance or routes of transmission; thus realizing at once in our postal union relations uniformity of postal charges, the chief result which the system of the Universal Postal Union is designed ultimately to accomplish throughout the world.

ADMISSIONS TO THE UNIVERSAL POSTAL UNION.

Since the conclusion of the Convention of Paris, the following accessions have been made to the Universal Postal Union:

1. The British Colonies of Newfoundland, Gold Coast, Senegambia, Lagos, Sierra Leone, Falkland Islands, and British Honduras, admitted from April 1, 1879.

2. The principality of Bulgaria, admitted from April 1, 1879.

3. The Leeward Islands (British), viz: Antigua, Dominica, Montserrat, Nevis, St. Christopher, and the Virgin Isles, admitted from July 1, 1879.

4. The Republic of Liberia, admitted from July 1, 1879.

5. The Republic of Honduras, admitted from October 1, 1879.

The United States of Venezuela have declared diplomatically their adhesion to the Universal Postal Union from the 1st of January, 1880.

The Republic of Chili, which was a party to the Convention of Paris, was unable to carry it into operation on the 1st of April, 1879, and its adhesion to the union has been indefinitely postponed.

INDEMNITY FOR LOST REGISTERED ARTICLES.

In my last report I recommended the necessary legislation to enable this department to accept the general regulation of the Universal Postal Union relative to the payment of a limited indemnity for registered articles lost or destroyed in the United States postal service. The Convention of Paris provides for the payment of 50 francs to the sender, or at his request to the addressee, of a lost registered article, by the administration upon whose territory or in whose maritime service the loss has occurred, except in case of *force majeure*, but stipulates as a temporary measure that the administrations of the countries beyond Europe, whose legislation is at present opposed to the principle of responsibility, may postpone the application of said regulation until the time when they shall have obtained legislative authority to subscribe to it. Although the payment of indemnities for registered articles lost or stolen in the mails is not sanctioned by our laws or applied in our domestic service, it is very generally practiced in other countries of the Universal Postal Union with which we exchange registered correspondence, and I therefore renew the request that authority be given by law to carry into effect this provision of the Paris Convention, both as to domestic and foreign registered matter.

COLLECTION OF CUSTOMS DUTIES UPON FOREIGN BOOKS RECEIVED BY MAIL.

The annoying inconveniences and delays to which American students and scholars have been subjected in obtaining single volumes of books mailed to them from abroad, in consequence of the regulation requiring all dutiable articles to be delivered to officers of the customs for the collection of duties, have been remedied by a new regulation adopted in pursuance of the authority given in section 17 of the act of March 3, 1879, which provides that books received from countries or colonies of the Universal Postal Union, which are found to be dutiable, shall, when addressed to post-offices other than the exchange office of receipt, be promptly transmitted by mail to the addressees, charged with the amount of customs duties levied thereon; which amounts postmasters at the offices of destination are required to collect on delivery and remit by first mail thereafter, under registration, to the collector of the customs of the district in which the exchange post-office of receipt is situated.

Under the General Postal Union Treaty concluded at Berne, books received from postal-union countries which were chargeable with customs duties, were held to be unmailable matter, and were immediately returned to the country of origin, thus imposing a complete embargo on the receipt of books by mail from abroad, and cutting off the facilities previously afforded by the mails for obtaining early copies of foreign literary and scientific works. The convention of Paris readopted the provision of the Berne treaty forbidding the transmission by mail of any packet whatever containing articles liable to customs duty, but added a stipulation that in case a packet falling under this prohibition should be delivered by one administration to another administration of the union, the latter was to proceed to dispose of it according to its interior laws and regulations. In pursuance of this provision the regulation of this department was modified by directing the delivery of dutiable articles by postmasters at exchange offices of receipt to collectors of the customs, with notice of such delivery to the addressees. Although this modified regulation effected an improvement in the treatment of dutiable books, it was not satisfactory either to the Treasury officials or the public, as it failed in many cases to secure the collection of the customs duties, and subjected addressees residing at places distant from ports of entry to vexatious delays and expenses incident to the employment of agents to pass their books through the custom-house. The new regulation obviates these delays and expenses, by insuring a prompt delivery of books at the office of destination in any part of the United States on payment of the customs duties, and cannot fail to satisfy those of our citizens who are accustomed to the use of the mails as the only practicable means of obtaining early access to foreign publications of scientific or literary interest.

TREATMENT OF OTHER DUTIABLE ARTICLES IN THE MAILS.

A similar regulation is needed for the treatment of other articles of mail matter received from foreign countries, which are subject by our laws to customs duty, and I respectfully recommend that the provision of section 17 of the act of March 3, 1879, authorizing the Secretary of the Treasury and the Postmaster-General to adopt regulations for the delivery to addressees in the United States of dutiable books, with collection of customs duties thereon be extended to embrace all articles of dutiable matter received in the mails from foreign countries.

As soon as provision is made for the transmission by mail and delivery to addressees of any article of dutiable mail matter received from abroad, it will be possible for this department to conclude arrangements with other postal administrations for the reciprocal exchange of small objects of merchandise, for which no provision is made in existing postal treaties or arrangements with foreign countries. Special arrangements of this character, commonly known as "parcel posts," are in operation between most European countries with satisfactory results, serving as

important auxiliaries to commerce, and affording convenient and rapid facilities for the interchange of small articles of scientific, literary, and social interest and importance.

FOREIGN MAIL STATISTICS.

In order to obtain the necessary data for estimating approximately the number of letters, postal cards, newspapers, and other articles of printed matter, commercial papers, and samples of merchandise, and amounts of prepaid and unpaid postage thereon, exchanged in the mails with foreign countries, instructions have been issued to all United States exchange post-offices for foreign mails to take an actual count semi-annually, during the first seven days of October and April of each year, with such details as are required for statistical purposes, and to enable this department to supply the International Bureau of the Universal Postal Union with the particulars of the United States postal service annually called for by that bureau.

PROTECTION TO POSTMASTERS IN PERSON AND PROPERTY.

I desire, respectfully, to call your attention to the fact that there is no United States statute imposing a penalty upon any one for assaulting or molesting a postmaster in the discharge of his official duties, as in the case of revenue officers, and I earnestly request that Congress be urged to pass such a statute.

Since my last report a decree has been rendered in the circuit court of the United States in and for the southern district of New York, upon a suit brought by Christopher C. Campbell *vs.* Thomas L. James, postmaster at New York, for relief against alleged infringements of letters patent for an improvement in post-office post-marking and canceling hand-stamps, granted to Marcus B. Norton on the 14th day of April, 1863, which post-office post-marking and canceling hand-stamps, it is claimed, have been for more than ten years and are now in general use in all the principal post-offices of this country. When suit was instituted against Mr. James, the United States attorney for the southern district of New York was instructed by the Attorney-General to appear and defend the suit. The case was tried upon its merits, and was decided adversely to the defendant. The court held substantially that the patent was a valid one; that the defendant had infringed and was liable for costs, charges, and damages, and ordered an account to be taken of the profits, gains, and advantages which have in any way been received or made, or which had arisen or accrued on account of the infringements, and also of the damages in addition thereto, if any, which the complainant has sustained by reason of the said infringements. Such accounting is now being taken. The validity of this patent and the utility of the invention were adjudged and affirmed, I am informed, in 1864, by the United States circuit court for the northern district of New York, and also by the Court of Claims in 1867. Reports to the same effect were

made by committees in the Thirty-ninth, Forty-first, and Forty-second Congresses.

Other postmasters than Mr. James are threatened with suits for like infringements; and there is great danger that they will be subjected to expense, unless some satisfactory adjustment shall be made.

In this connection, I desire to call attention to the fact that there is no provision of federal law to secure "certificates of probable cause" to United States officials, other than Treasury officials, in cases of adverse judgments for acts done in their official capacity. In the present instance, Mr. James, as postmaster, uses canceling-stamps furnished by this department. The court adjudges him to have infringed a patent by such use.

The judgment for damages is against him personally. In like cases, the property of Treasury officials is protected by law from levy. I submit that similar protection is due to all government employes, when acting in the line of their duty.

THE NEW CLASSIFICATION OF MAIL-MATTER.

The law providing for a new classification of mail-matter, and readjusting the rates of postage thereon, passed at the last session of the Forty-fifth Congress, which went into effect on the first day of May last, has given universal satisfaction.

In framing regulations to carry it into successful operation, the department has endeavored to display the same liberal spirit which actuated Congress in its passage. Such reports as have been received from various officers of the service show that it is better understood by the public than the former law, has served very much to diminish complaint against the administration of the different post-offices throughout the country, and has removed very much of the friction that existed in the service under the old law. Especially is this true in respect to second-class matter.

The difficulties which presented themselves under the old law in determining the boundary line between periodical publications of a general character and those which are designed primarily for advertising purposes, have been very materially reduced by a simple regulation providing for the entry at the post-office where mailed of any publication which had been determined to be of the second class, and the printing of a certificate of entry on each copy of the publication issued. This is practically in accordance with the recommendation made by me in my report for 1877, with this exception, that the entry is only made upon the voluntary request of the publisher or publishers.

As an indication of the popularity of this regulation, I call attention to the fact that up to the first day of November about twenty-five hundred publications have been entered in accordance with the regulations, which is nearly, if not quite, one-third of all those mailed as second-class matter, including among the number nearly all the leading publications

of the country. I am confident that the remaining ones will all, or nearly all, of them enter, and that when they shall have so entered the solution of this vexed question will be reached.

LOTTERY LETTERS.

By the act of July 12, 1876 (19 Statutes, p. 90), section 3894 Revised Statutes was amended by striking out the word "illegal" preceding the word "lottery," and it is suggested that sections 3929 and 4041, Revised Statutes, be also amended by striking out the word "fraudulent" preceding the word "lottery" in each section, which will make the legislation more harmonious and effective.

It would aid the department in the execution of the intent of the law, if the provision of section 3929, requiring the return to the writers of registered letters addressed to such schemes, were in terms extended to include all letters so addressed.

Under the sections referred to orders have been issued, to the 10th day of October, 1879, against 117 individuals or companies engaged in fraudulent schemes, requiring the return of registered letters to the writers, and the refusal to issue or to pay to such persons or companies any money orders, and directing the return of the sum indicated to the sender on application. But one of these orders has been successfully contested and its revocation demanded and granted.

On the 4th day of October, 1879, upon an opinion given by the Assistant Attorney-General for the Post-Office Department, an order was issued to postmasters directing them to refuse to mail or register letters or circulars addressed to lottery companies, or to individuals, when addressed to them as agents for such companies. The opinion upon which this order was based was in brief that under section 3894, Revised Statutes of the United States, the only recognition in the postal laws of lottery companies is the declaration that "no letter or circular concerning lotteries" * * * "shall be carried in the mails"; and imposing a fine upon "any person who shall knowingly deposit or send anything to be conveyed by mail in violation of this section"; that the entire postal correspondence of a lottery company acting under its charter is a violation of this prohibition, and that an agent in the execution of his agency can claim no right not accorded to his principals; that a lottery company chartered by State authority is not a citizen of the United States, and correspondence concerning its business, being excluded by law from the mails, such company cannot claim postal facilities. Under this order a large number of letters addressed to a lottery company, or to a private individual as an agent of such company, were held by the postmaster at Louisville, Ky., and suits were at once instituted by said agent against the postmaster, which, under instructions from the Attorney-General of the United States, on my application to him, were defended by the United States district attorney for that district, and, as representing the department, by the Assistant

Attorney-General for the Post-Office Department. The decision has not yet been rendered in the United States circuit court, and I will avail myself of that decision, when announced, to communicate further the views of this department upon this subject.

Upon the question whether, under the present statute, the correspondence reaching an individual addressed to him personally under seal, can be held, although the person openly and notoriously advertises himself as an agent of a lottery company and invites letters "concerning lotteries" to be thus addressed to him, and communications so addressed reach the office in extraordinary numbers, the department is not fully advised. Whether an individual may forfeit his right to use the mail for legitimate purposes by voluntarily mingling such correspondence with prohibited matter, so that the department must carry both or neither, is a question upon which additional legislation might render the purpose of the statute altogether unquestionable.

The carriage by the mail of newspapers, containing lottery advertisements soliciting violations of the postal laws, renders the successful enforcement of the statute now in force still more difficult.

The department has caused inquiry to be made by its special agents and from postmasters at various points to enable it to form a proximate estimate of the quantity of letters and circulars "concerning lotteries" which reach their post-office of destination and are there withheld from delivery by reason of the evidence apparent upon the matter itself of its illegal character. The details are as yet too incomplete to lay before you, but they already disclose the fact that the postal service is used to an almost inconceivable extent to foster and sustain these fraudulent schemes.

OUR POSTAL SERVICE COMPARED WITH THAT OF ENGLAND AND FRANCE.

In accordance with the suggestion made in my annual report for 1877, Mr. W. A. Knapp, chief clerk of the department, who had been requested by the Secretary of the Treasury to proceed to London, England, upon business connected with refunding, was directed by me to prolong his stay in London for a sufficient time to examine the operations of the British postal service, and to visit France to inspect the postal service of that country. The results of his observations will be found appended to this report (pages 307-329), and his suggestions are commended to the serious consideration of Congress. I desire to make public acknowledgment of my appreciation of the kindness and courtesy displayed by the postal administrations of England and France in affording to the representative of this department every possible facility in pursuing his investigations.

DISPOSAL OF VALUELESS PAPERS ON FILE.

This department is put to great inconvenience by the accumulation of records, files, and papers, many of which are of no value at this date.

The room which they occupy is very much needed for other purposes; many of them are stored in the upper story of the department building, and are of such a nature as to threaten the safety of the building in case of fire. I have not felt authorized to order the destruction of any of these papers, without authority given by Congress. I earnestly recommend that Congress enact a law giving the Postmaster-General authority to destroy or sell for waste paper such records and papers as are mentioned in the accompanying report of the Auditor as having no permanent value.

THE NEW EDITION OF THE POSTAL LAWS AND REGULATIONS.

In accordance with the provisions of section 1 of the act of March 3, 1879, providing for the preparation and publication of a new edition of the postal laws and regulations, appropriating \$20,000 for the same, and authorizing the Postmaster-General to designate two officers of this department to prepare such work, Messrs. A. H. Bissell, law clerk, and Thomas B. Kirby, stenographer of the department, were appointed to edit and superintend the publication of the same. The work has been done to the entire satisfaction of the department, and all postmasters and employes of the railway mail service have been furnished with the new regulations. Frequent applications are made to the department by the public for copies of this book, which the department is unable to supply.

I would therefore recommend that the Public Printer be authorized to print a new edition from the stereotype plates, to be sold to the public at cost.

THE POSTAL GUIDE.

A contract was made with Houghton, Osgood & Co., of Boston, Mass., for the continuation of the publication of the Postal Guide during the present fiscal year. The form of the Guide has been changed, and the lists of post-offices are now to be published annually, with monthly corrections. The monthly numbers of the Guide also contain all orders and rulings of the department, and the necessity for issuing circulars to postmasters is thus obviated, thereby saving much expense for printing and a large amount of clerical labor in the department. The present appropriation is only sufficient for an edition of 46,500 copies, which is now barely enough to supply the officers and employes of the postal service, and will be entirely inadequate for the next year. I would recommend that the appropriation for next year be \$30,000, and that authority be given to the Postmaster-General to contract for the publication of the Guide for a term of five years, as was done by the act of June 23, 1874. The usefulness of the Postal Guide in its present form, in maintaining uniformity in the postal system, and thereby increasing the efficiency of the service, is so great that I can hardly conceive of a more serious misfortune than the failure of Congress to provide for a continuance

of its publication and an extension of its circulation to keep up with the growth of the postal service. If, as is hoped, authority is given to the Postmaster-General to contract for the publication of the Guide for a term of five years or less, he should be authorized, in case of necessity, to continue the contract with the present publishers for another year, in order to avoid a discontinuance of the publication pending the awarding of a new contract. It is doubtful if as favorable a contract as the present could be made in the existing state of the market for labor and material.

THE WASHINGTON CITY POST-OFFICE.

In accordance with the joint resolution of June 27, 1879, the commission appointed to lease a building in Washington, D. C., for the purpose of a city post-office, have leased the building known as the Seaton House, on Louisiana avenue and C street, near Seventh street, for the term of five years, at an annual rental of \$5,000. The removal of the city post-office from the department building will greatly assist in the transaction of business by affording much-needed additional room.

THE PHILADELPHIA POST-OFFICE.

Attention is called to the urgent necessity for the prompt completion of the new post-office building at Philadelphia, Pa. The new building could, with adequate appropriations, be made ready for occupancy in six months, and the building now occupied is entirely too small for the proper transaction of the postal business of the second city in the Union.

RESULTS OF A COUNT OF ALL MATTER MAILED.

In order to enable the department to procure reliable statistics of the amount of domestic mail-matter actually transmitted in the United States mails, an annual count has been ordered upon the first seven days of November in each year of all matter mailed at all post-offices and postal cars. The returns for the count of November, 1879, now coming in, when tabulated will show with almost entire accuracy the business transacted by this department. The count at New York City shows that there were mailed at that office during the first seven days of November, 1879, 2,352,308 letters, 648,353 postal cards, 2,561,011 pieces of second-class matter, 1,513,530 pieces of third-class matter, and 118,088 pieces of fourth-class matter, making a grand total of 7,193,290 pieces of mail matter originating at that office during the week. The details of the count at a few of the principal cities of the Union and in the Railway Mail Service will be found appended to this report, pages 352-367.

Very respectfully, your obedient servant,

D. M. KEY,
Postmaster-General.

The PRESIDENT.

REPORT

OF THE

FIRST ASSISTANT POSTMASTER-GENERAL.

REPORT
OF THE
FIRST ASSISTANT POSTMASTER-GENERAL.

POST-OFFICE DEPARTMENT,
OFFICE OF THE FIRST ASSISTANT POSTMASTER-GENERAL,
Washington, D. C., November 7, 1879.

SIR: I submit herewith statistical tables marked respectively A, B, and C, exhibiting in detailed forms the operations of the free-delivery and of the appointment division of this office for the fiscal year ended June 30, 1879. The increased business of those divisions over that of the previous fiscal year, as shown by these statements, is of a very satisfactory character.

Very respectfully,

JAS. N. TYNER,
First Assistant Postmaster-General.

Hon. D. M. KEY,
Postmaster-General.

A.—Statement of the operations of the free-delivery

Post-offices.	Number of carriers in service June 30, 1879.	Delivered.					
		Mail.		Local.		Registered letters.	Newspapers.
		Letters.	Postal cards.	Letters.	Postal cards.		
Albany, N. Y.	27	2, 192, 106	407, 673	232, 938	193, 511	7, 731	1, 020, 404
Allegheny, Pa.	11	1, 024, 187	192, 366	128, 168	71, 138	3, 854	662, 513
Atlanta, Ga.	6	779, 185	289, 324	71, 983	76, 633	13, 654	567, 875
Baltimore, Md.	67	5, 427, 752	984, 320	1, 230, 360	924, 373	31, 284	2, 463, 061
Bangor, Me.	4	270, 676	60, 683	24, 363	7, 921	3, 523	149, 092
Boston, Mass.	169	10, 049, 114	2, 402, 895	4, 739, 650	2, 397, 273	45, 322	5, 669, 937
Bloomington, Ill.	6	696, 550	136, 772	24, 822	26, 333	3, 057	363, 835
Brooklyn, N. Y.	93	5, 353, 622	1, 288, 971	1, 457, 551	1, 070, 921	25, 488	3, 038, 861
Buffalo, N. Y.	36	3, 507, 303	478, 455	477, 296	393, 832	26, 614	2, 136, 249
Burlington, Iowa.	6	609, 753	112, 689	39, 939	33, 522	2, 803	451, 571
Camden, N. J.	6	844, 842	134, 086	56, 828	43, 967	1, 758	283, 369
Charleston, S. C.	8	502, 748	117, 379	62, 022	70, 250	4, 635	306, 133
Chicago, Ill.	162	19, 562, 513	3, 548, 725	3, 713, 585	2, 258, 594	195, 021	6, 201, 023
Cincinnati, Ohio.	73	7, 334, 321	1, 115, 675	1, 616, 226	970, 285	33, 829	2, 455, 480
Cleveland, Ohio.	34	3, 957, 299	1, 033, 458	572, 017	335, 099	40, 402	2, 037, 096
Columbus, Ohio.	12	1, 223, 551	300, 455	103, 805	104, 064	8, 866	793, 761
Covington, Ky.	5	283, 814	71, 577	20, 731	18, 890	1, 056	188, 512
Davenport, Iowa.	8	580, 775	120, 615	38, 977	31, 867	2, 883	377, 438
Dayton, Ohio.	12	1, 115, 090	296, 815	129, 074	84, 381	8, 806	682, 723
Des Moines, Iowa.	7	592, 213	186, 557	55, 435	46, 939	3, 656	484, 711
Detroit, Mich.	31	4, 524, 279	905, 171	583, 332	221, 045	35, 305	2, 556, 699
Dubuque, Iowa.	5	544, 294	152, 851	27, 598	26, 872	4, 951	327, 627
Easton, Pa.	6	983, 982	451, 670	102, 518	113, 188	1, 319	588, 066
Elizabeth, N. J.	8	439, 511	93, 482	65, 724	25, 362	1, 119	370, 181
Elmira, N. Y.	7	779, 591	173, 703	52, 917	25, 684	5, 963	325, 356
Erie, Pa.	7	667, 053	59, 105	56, 861	39, 014	1, 021	464, 369
Evansville, Ind.	7	584, 896	171, 905	34, 136	41, 781	5, 270	444, 588
Fall River, Mass.	6	470, 568	38, 513	26, 127	14, 516	565	329, 692
Fort Wayne, Ind.	7	831, 190	92, 968	83, 144	85, 438	3, 547	680, 975
Grand Rapids, Mich.	8	984, 795	251, 186	129, 569	70, 705	7, 406	673, 063
Harrisburg, Pa.	6	386, 308	105, 283	27, 379	25, 385	1, 192	363, 143
Hartford, Conn.	11	938, 447	186, 036	265, 586	112, 024	2, 863	796, 069
Hoboken, N. J.	4	267, 074	74, 646	17, 678	26, 697	1, 246	161, 023
Indianapolis, Ind.	22	2, 870, 908	557, 407	313, 597	189, 929	18, 887	1, 524, 173
Jersey City, N. J.	18	986, 828	190, 479	177, 613	135, 432	3, 667	511, 436
Kansas City, Mo.	11	2, 223, 228	455, 740	157, 140	101, 167	16, 200	953, 969
Lafayette, Ind.	5	331, 401	108, 321	30, 860	13, 741	2, 097	290, 922
Lancaster, Pa.	5	546, 566	100, 426	34, 190	23, 015	1, 280	316, 951
Lawrence, Mass.	8	697, 423	74, 055	52, 586	60, 817	1, 056	567, 411
Leavenworth, Kans.	5	394, 782	74, 372	16, 390	15, 158	2, 039	268, 304
Louisville, Ky.	30	3, 127, 565	737, 445	378, 213	425, 042	30, 240	1, 464, 127
Lowell, Mass.	10	633, 738	108, 072	90, 340	50, 519	1, 670	317, 546
Lynn, Mass.	7	595, 074	138, 557	44, 670	72, 857	699	828, 966
Manchester, N. H.	5	570, 551	134, 373	27, 543	38, 594	6, 267	483, 851
Memphis, Tenn.	13	1, 369, 770	177, 608	86, 959	85, 245	17, 221	396, 489
Milwaukee, Wis.	26	3, 342, 681	493, 192	385, 809	373, 293	23, 191	1, 250, 676
Minneapolis, Minn.	10	767, 792	126, 753	67, 506	68, 878	6, 151	562, 801
Mobile, Ala.	6	320, 997	62, 202	36, 597	21, 921	2, 285	353, 113
Nashville, Tenn.	10	1, 194, 294	282, 116	95, 685	75, 791	15, 144	847, 875
Newark, N. J.	24	1, 930, 774	515, 603	413, 784	282, 417	8, 456	1, 065, 683
New Bedford, Mass.	7	741, 025	64, 173	56, 917	31, 320	6, 010	410, 368
New Haven, Conn.	16	907, 390	159, 408	125, 863	82, 150	2, 013	763, 222
New Orleans, La.	47	1, 789, 745	235, 467	378, 573	297, 048	23, 992	963, 062
New York, N. Y.	440	42, 938, 460	7, 264, 740	24, 759, 629	9, 161, 028	320, 265	12, 862, 504
Norfolk, Va.	5	539, 644	141, 704	45, 760	45, 441	1, 549	329, 390
Oakland, Cal. (9 mos.)†	6	256, 447	32, 290	19, 745	11, 367	666	149, 857
Omaha, Neb.	6	706, 735	114, 861	57, 686	51, 347	6, 310	473, 723
Oswego, N. Y.	6	420, 641	100, 996	26, 810	14, 000	1, 364	268, 103
Patterson, N. J.	7	478, 901	75, 143	49, 307	32, 239	1, 603	457, 465
Peoria, Ill.	8	653, 863	185, 083	38, 796	32, 478	3, 716	400, 635
Petersburgh, Va.	5	455, 975	95, 378	16, 908	17, 373	2, 767	328, 934
Philadelphia, Pa.	253	23, 497, 592	4, 378, 537	14, 015, 099	5, 665, 496	97, 820	13, 695, 201
Pittsburgh, Pa.	34	2, 289, 093	513, 319	524, 210	299, 312	13, 818	1, 137, 446
Portland, Me.	10	654, 407	177, 980	63, 890	85, 217	2, 742	662, 913
Pottsville, Pa.	4	248, 893	70, 921	22, 352	11, 646	942	332, 655
Poughkeepsie, N. Y.	6	625, 400	83, 677	60, 452	50, 003	1, 535	544, 678
Providence, R. I.	21	1, 151, 253	274, 609	284, 257	139, 276	3, 631	673, 266
Quincy, Ill.	7	638, 364	180, 566	47, 143	64, 334	6, 201	385, 557
Reading, Pa.	8	725, 430	161, 584	56, 358	54, 298	2, 000	434, 464
Richmond, Va.	16	1, 266, 702	341, 913	105, 536	100, 104	11, 823	644, 758
Rochester, N. Y.	22	2, 527, 371	286, 816	295, 567	265, 928	24, 300	1, 072, 533
Saint Joseph, Mo.	7	843, 775	87, 923	72, 119	47, 305	8, 927	636, 613

* Two carriers appointed May 1, 1879.

† Established October 1, 1878.

system for the year ending June 30, 1879.

Collected.			Pieces handled.		Cost of service (including incidental expenses).			Postage on local matter.
Letters.	Postal cards.	Newspapers.	Aggregate.	Per carrier.	Aggregate.	Per piece.	Per carrier.	
1, 342, 962	375, 331	190, 225	5, 966, 081	219, 855	\$20, 585 06	3.45	\$762 43	\$8, 083 31
530, 702	128, 434	94, 616	2, 835, 978	257, 816	8, 306 56	2.93	755 14	5, 039 02
539, 376	211, 013	44, 012	2, 593, 055	432, 176	4, 584 14	1.76	784 02	3, 147 38
7, 084, 292	1, 596, 679	340, 790	20, 023, 091	296, 852	57, 071 46	2.85	851 81	38, 602 82
329, 443	96, 560	29, 374	972, 235	243, 059	3, 127 58	3.22	781 89	1, 101 38
14, 332, 638	4, 088, 287	1, 883, 972	45, 609, 088	269, 876	136, 256 84	3.05	824 00	172, 460 25
221, 902	100, 424	45, 937	1, 549, 632	258, 272	4, 611 54	2.97	788 59	1, 497 02
4, 123, 120	1, 623, 159	597, 099	18, 578, 812	199, 772	77, 470 11	4.17	783 01	64, 120 10
543, 788	793, 748	246, 619	10, 593, 904	294, 247	30, 036 74	2.83	834 35	15, 243 75
397, 647	130, 845	155, 875	1, 934, 644	322, 441	4, 457 44	2.34	742 91	1, 474 56
287, 687	80, 343	57, 852	1, 790, 551	298, 425	4, 646 15	2.60	774 36	2, 240 90
363, 561	124, 662	59, 174	1, 550, 564	193, 820	6, 057 97	3.90	757 24	2, 655 90
049, 115	5, 211, 788	6, 987, 780	69, 723, 144	430, 390	137, 000 07	1.96	845 68	123, 642 05
6, 181, 900	1, 377, 175	556, 879	21, 641, 550	296, 432	62, 732 41	2.90	859 35	54, 103 46
2, 835, 054	1, 115, 370	433, 249	12, 360, 546	863, 545	30, 063 62	2.48	900 11	28, 032 14
367, 065	280, 433	74, 248	3, 656, 378	304, 698	9, 583 36	2.62	798 61	4, 665 93
130, 569	34, 206	14, 032	773, 359	154, 672	3, 616 76	4.68	723 35	9, 932 63
297, 133	109, 232	28, 554	1, 587, 474	198, 434	5, 937 82	3.74	742 23	2, 112 00
789, 298	304, 442	321, 792	3, 732, 481	811, 040	9, 255 33	2.48	771 28	4, 055 98
589, 437	239, 481	85, 401	2, 233, 830	319, 119	5, 496 04	2.45	783 72	2, 678 56
1, 875, 002	477, 122	252, 399	11, 428, 725	368, 669	27, 348 06	2.39	882 19	15, 598 15
486, 620	170, 926	44, 584	1, 808, 323	361, 665	3, 714 15	2.05	742 83	1, 142 96
826, 597	265, 314	436, 722	3, 719, 576	619, 929	4, 582 92	1.23	763 82	3, 474 24
216, 605	86, 445	27, 851	1, 308, 280	218, 047	4, 734 64	3.62	789 11	1, 814 52
299, 132	89, 951	35, 503	1, 777, 052	253, 965	4, 969 64	2.80	709 95	2, 017 38
278, 325	83, 628	28, 930	1, 678, 306	239, 758	5, 563 61	3.31	794 80	2, 359 82
401, 328	154, 790	54, 808	2, 011, 001	287, 286	5, 592 07	2.78	798 87	1, 624 88
173, 968	33, 249	30, 244	1, 107, 482	184, 580	3, 184 79	2.87	530 80	2, 061 61
644, 871	106, 097	90, 950	2, 619, 180	374, 169	5, 445 00	2.77	777 86	3, 823 88
477, 235	233, 394	74, 847	8, 081, 700	885, 212	6, 192 36	2.01	774 04	3, 864 33
148, 501	58, 785	12, 435	1, 067, 371	177, 895	4, 496 07	4.21	749 68	1, 866 60
676, 325	141, 316	90, 429	8, 143, 524	285, 775	8, 028 23	2.56	729 84	6, 897 53
118, 215	50, 118	8, 314	8, 065, 821	166, 455	2, 958 24	4.44	739 56	699 58
1, 756, 895	585, 633	256, 843	8, 068, 267	288, 152	23, 614 92	2.93	845 18	10, 872 55
501, 514	175, 910	63, 871	2, 026, 452	157, 025	12, 588 37	4.45	699 35	5, 675 34
1, 086, 006	349, 047	330, 829	5, 083, 343	516, 068	8, 895 19	1.56	808 65	6, 738 08
203, 743	77, 608	27, 629	1, 066, 317	211, 263	3, 648 95	3.46	729 79	1, 103 84
106, 791	49, 417	11, 878	1, 244, 624	248, 925	3, 809 02	3.05	761 80	996 17
747, 326	86, 457	64, 399	2, 371, 530	296, 441	6, 302 49	2.24	787 81	2, 004 94
346, 514	65, 225	70, 517	1, 253, 301	250, 060	3, 678 75	2.93	735 75	676 01
2, 182, 090	729, 034	351, 634	9, 425, 420	314, 181	26, 090 19	2.82	896 97	15, 528 67
495, 910	102, 148	49, 054	1, 848, 997	184, 900	7, 516 85	4.06	751 68	4, 123 09
422, 817	151, 804	42, 462	1, 792, 817	256, 117	5, 714 11	3.19	816 30	1, 979 27
258, 543	82, 034	34, 229	1, 036, 075	327, 215	3, 841 08	2.35	768 22	1, 260 57
719, 084	163, 882	106, 189	3, 116, 427	339, 725	9, 839 78	3.15	756 91	2, 657 75
1, 662, 444	707, 506	298, 278	8, 537, 070	328, 350	23, 836 58	2.79	916*79	14, 367 28
525, 953	150, 000	66, 403	2, 391, 337	239, 134	8, 163 55	3.41	816 35	3, 745 84
349, 296	71, 304	140, 086	1, 357, 801	226, 300	4, 004 14	2.95	667 36	1, 700 80
477, 845	164, 750	98, 967	3, 243, 382	324, 338	7, 613 10	2.35	761 31	3, 786 27
1, 116, 921	377, 655	123, 036	5, 774, 529	240, 605	20, 216 24	3.50	842 34	12, 089 20
361, 900	83, 340	25, 495	1, 775, 239	253, 606	5, 580 30	3.14	797 19	2, 478 98
731, 335	99, 106	91, 054	2, 961, 551	185, 097	11, 772 45	3.98	735 78	14, 878 92
2, 314, 472	2, 093, 337	732, 013	8, 828, 249	187, 835	39, 520 29	4.48	840 85	13, 298 29
96, 512, 356	19, 521, 740	11, 218, 264	224, 589, 132	510, 430	352, 233 55	1.57	800 53	1, 498, 193 32
592, 099	164, 699	52, 147	1, 912, 312	382, 462	3, 821 52	1.99	764 30	2, 446 95
143, 843	25, 211	15, 938	648, 864	108, 144	3, 272 01	5.04	545 35	1, 371 89
548, 218	184, 633	45, 515	2, 189, 028	364, 838	4, 604 19	2.10	767 36	3, 232 92
281, 303	84, 533	33, 481	1, 231, 231	205, 205	4, 646 87	3.77	774 48	801 16
276, 954	82, 496	51, 782	1, 505, 821	215, 117	5, 651 78	3.75	807 39	2, 022 94
458, 907	156, 157	81, 814	2, 014, 439	251, 805	6, 353 74	3.15	769 22	1, 796 77
255, 522	86, 090	34, 052	1, 290, 001	258, 000	8, 886 14	3.01	777 23	567 73
32, 950, 094	7, 390, 106	6, 199, 521	107, 898, 566	426, 477	223, 954 18	2.07	885 19	380, 545 76
1, 868, 877	502, 078	230, 461	7, 378, 508	217, 015	29, 282 36	3.97	861 24	17, 256 49
1, 113, 350	273, 035	132, 442	2, 865, 976	286, 598	7, 718 25	2.90	771 82	3, 974 57
148, 901	55, 795	49, 717	941, 222	235, 305	8, 079 84	3.27	769 96	819 58
636, 470	133, 514	127, 592	2, 263, 321	377, 220	4, 618 70	2.04	769 78	1, 999 69
737, 110	201, 806	70, 379	3, 853, 627	168, 363	18, 133 07	5.13	862 53	14, 642 57
318, 580	114, 868	19, 532	1, 778, 125	254, 018	6, 589 79	3.14	798 54	2, 123 91
336, 947	125, 290	32, 958	1, 929, 338	241, 167	6, 228 14	3.23	778 52	1, 965 57
751, 946	292, 017	111, 290	3, 626, 089	227, 256	12, 063 88	3.32	753 99	3, 841 39
1, 454, 579	230, 611	149, 279	6, 307, 043	286, 684	17, 263 42	2.74	784 70	11, 327 98
528, 823	168, 879	84, 963	2, 481, 347	354, 478	5, 225 27	2.11	746 47	2, 562 70

A.—Statement of the operations of the free-delivery

Post-offices.	Number of carriers in service June 30, 1879.	Delivered.					
		Mail.		Local.		Registered letters.	Newspapers.
		Letters.	Postal cards.	Letters.	Postal cards.		
Saint Louis, Mo.	115	10,785,830	1,718,863	1,556,782	1,292,728	94,939	4,760,215
Saint Paul, Minn.	10	1,402,762	283,896	105,085	83,523	16,643	713,673
Salem, Mass.	6	869,442	95,762	43,157	43,606	17	338,304
San Francisco, Cal.	50	3,781,729	327,595	1,577,585	848,950	20,697	2,902,447
Savannah, Ga.	6	470,765	94,968	70,639	55,588	3,883	250,414
Springfield, Ill.	5	463,858	129,246	27,239	20,008	1,929	407,892
Springfield, Mass.	8	733,343	177,622	76,453	39,640	2,144	240,410
Syracuse, N. Y.	16	1,810,097	345,959	223,153	174,788	8,256	1,091,466
Toledo, Ohio.	14	1,658,709	204,472	176,720	114,436	7,555	653,425
Trenton, N. J.	6	413,815	111,570	40,687	26,282	1,039	304,382
Troy, N. Y.	15	1,646,451	266,589	236,636	135,662	4,064	842,782
Utica, N. Y.	12	1,048,342	264,928	110,620	64,213	5,508	561,910
Washington, D. C.	44	2,947,616	423,334	464,222	234,367	11,135	1,783,357
Wheeling, W. Va.	6	589,076	177,058	47,493	36,717	6,045	311,111
Wilmington, Del.	10	647,635	135,322	79,289	57,586	2,078	365,130
Worcester, Mass.	11	682,958	147,048	115,772	111,209	.....	431,493
Total aggregates and averages...	2,359	213,996,862	40,299,460	64,710,184	31,904,474	1,410,044	102,363,370
Compensation of special agents of the Post-Office Department paid out of appropriations for							
Total							

system for the year ending June 30, 1879—Continued.

Collected.			Pieces handled.		Cost of service (including incidental expenses).			Postage on local matter.
Letters.	Postal cards.	Newspapers.	Aggregate.	Per carrier.	Aggregate.	Per piece.	Per carrier.	
						<i>Mills.</i>		
7,790,887	2,140,405	2,056,046	32,196,695	279,971	\$95,056 14	2.95	\$826 57	\$46,650 48
781,820	263,127	103,859	3,754,388	375,439	7,513 10	2.00	751 31	3,639 44
274,206	81,170	72,447	1,318,111	219,685	4,419 47	3.35	736 58	1,544 30
6,510,732	1,067,387	1,016,426	17,153,548	343,071	49,313 50	2.87	986 27	47,535 27
490,180	128,574	67,605	1,632,616	272,103	4,491 78	2.75	748 63	3,016 56
195,140	69,467	41,531	1,356,310	271,262	3,869 99	2.85	774 00	1,287 64
276,139	125,296	52,820	1,723,837	215,480	6,031 11	3.50	753 89	3,402 88
1,060,962	371,976	155,400	5,242,077	327,629	11,829 64	2.26	739 35	6,716 45
1,278,070	320,044	210,561	4,623,990	330,285	11,507 91	2.50	821 99	4,906 78
296,855	76,529	52,399	1,323,558	220,593	4,297 32	3.25	716 22	2,154 17
1,472,389	314,807	267,796	5,187,176	345,815	11,433 81	2.20	762 25	6,500 34
852,706	253,263	87,439	3,249,019	270,751	9,468 55	2.91	789 04	3,090 07
2,027,642	390,467	389,194	8,671,334	197,076	36,449 10	4.20	828 39	17,674 89
321,950	166,913	58,756	1,915,119	319,186	4,694 02	2.44	780 67	1,708 74
302,407	104,608	24,848	1,718,903	171,890	7,575 10	4.40	757 51	2,825 04
414,445	129,296	53,707	2,085,928	189,630	8,639 28	4.14	785 39	5,332 75
353,174,241	62,130,796	39,862,632	809,854,065	339,065	1,942,261 15	2.40	828 34	2,812,523 86
letter-carriers from July 1, 1878					5,445 46			
					1,947,706 61			



B.—Total operations of the appointment division of the office of the First Assistant Postmaster-General for the year ended June 30, 1879.

States and Territories.	Post-offices.				Postmasters.			
	Established.	Discontinued.	Names and sites changed.	Appointments on change of names and sites.	Resigned and commissions expired.	Removed.	Deceased.	Total number of cases.
Alabama.....	110	28	7	9	192	29	22	328
Alaska.....			1	1	2			3
Arizona.....	26	5	8	3	22	3		64
Arkansas.....	146	62	16	7	219	18		445
California.....	52	30	11		100	6	10	209
Colorado.....	45	17	1	1	83	7	3	156
Connecticut.....	6	2	3	2	25	4	2	42
Dakota.....	87	14	20	5	47	14	1	128
Delaware.....	1				7	1		9
District of Columbia.....					1			1
Florida.....	44	9	5	2	49	12	4	123
Georgia.....	97	30	12	1	149	9	18	315
Idaho.....	14	14	5	3	24	1		54
Illinois.....	46	27	17	2	313	15	9	427
Indiana.....	64	25	4	3	283	33	19	428
Indian Territory.....	15	7	2	1	19	1	1	45
Iowa.....	57	46	11	1	217	20	10	361
Kansas.....	212	49	53	38	249	13	7	563
Kentucky.....	94	47	9	4	233	26	16	425
Louisiana.....	52	22	6	2	63	8	13	164
Maine.....	16	9	1		64	13	11	114
Maryland.....	32	8	5	3	63	6	10	124
Massachusetts.....	9	3	1		46	3	6	64
Michigan.....	73	40	8	5	163	33	7	324
Minnesota.....	88	35	26	10	120	23	4	296
Mississippi.....	50	18	11	4	82	7	14	191
Missouri.....	95	55	23	4	296	19	16	507
Montana.....	23	16	3	2	28	3	2	75
Nebraska.....	85	32	26	18	113	18	4	278
Nevada.....	22	4	3	2	27	5	1	62
New Hampshire.....	9	5	2	1	28	6	3	53
New Jersey.....	9	5	7	3	47	5	11	84
New Mexico.....	21	15	5		23	2	2	66
New York.....	64	13	10	5	228	49	32	366
North Carolina.....	107	42	18	11	162	16	9	354
Ohio.....	79	25	7		271	23	15	420
Oregon.....	49	24	7	3	74	4	3	161
Pennsylvania.....	78	35	24	5	336	27	26	526
Rhode Island.....	1		1	1	6	6	4	12
South Carolina.....	37	14	9	1	72	2	1	125
Tennessee.....	109	31	15	4	212	25	20	412
Texas.....	173	86	10	7	263	7	16	555
Utah.....	18	10	4		28	4	2	66
Vermont.....	4	3			45	2	2	54
Virginia.....	106	45	9	6	183	10	11	364
Washington.....	36	7	5		52	3		103
West Virginia.....	35	23	6	3	118	6	1	189
Wisconsin.....	58	34	21	4	165	17	6	301
Wyoming.....	13	8	2		12			35
Total.....	2, 076	1, 079	490	187	5, 627	558	378	10, 778

C.—Table showing the increase and decrease of post-offices in the several States and Territories; also the number of post-offices at which appointments are made by the President and by the Postmaster-General, for the year ended June 30, 1879.

States and Territories.	Whole number of post-offices in the United States June 30, 1878.	Whole number of post-offices in the United States June 30, 1879.	Increase.	Decrease.	Number of postmasters appointed by the President June 30, 1878.	Number of postmasters appointed by the President June 30, 1879.	Increase.	Decrease.	Number of postmasters appointed by the Postmaster-General June 30, 1878.	Number of postmasters appointed by the Postmaster-General June 30, 1879.	Increase.	Decrease.
Alabama.....	967	1,049	82		17	22	5		950	1,027	77	
Alaska.....	2	2							2	2		
Arizona.....	53	74	21		2	3	1		51	71	20	
Arkansas.....	750	824	54		8	8			742	826	84	
California.....	814	836	22		42	49	7		772	787	15	
Colorado.....	265	293	28		12	16	4		253	277	24	
Connecticut.....	440	444	4		45	49	4		395	395		
Dakota.....	206	279	73		4	6	2		202	273	71	
Delaware.....	106	107	1		4	6	2		102	101		1
District of Columbia.....	6	6			1	1			5	6	1	
Florida.....	271	306	35		7	7			264	299	35	
Georgia.....	898	965	67		21	23	2		877	942	65	
Idaho.....	92	92			2	3	1		90	89		1
Illinois.....	1,938	1,957	19		150	162	12		1,788	1,795	7	
Indiana.....	1,571	1,610	39		67	72	5		1,504	1,538	34	
Indian Territory.....	62	70	8						62	70	8	
Iowa.....	1,456	1,467	11		94	97	3		1,363	1,370	7	
Kansas.....	1,226	1,389	163		33	46	13		1,193	1,343	150	
Kentucky.....	1,239	1,286	47		27	28	1		1,212	1,258	46	
Louisiana.....	394	424	30		9	10	1		385	414	29	
Maine.....	914	921	7		26	31	5		888	890	2	
Maryland.....	640	664	24		12	13	1		628	651	23	
Massachusetts.....	739	745	6		103	108	5		636	637	1	
Michigan.....	1,292	1,325	33		71	81	10		1,221	1,244	23	
Minnesota.....	905	958	53		27	31	4		878	927	49	
Mississippi.....	621	662	41		16	20	4		605	642	37	
Missouri.....	1,606	1,646	40		42	49	7		1,554	1,597	43	
Montana.....	116	123	7		6	6			110	117	7	
Nebraska.....	639	692	53		17	23	6		622	669	47	
Nevada.....	97	115	18		10	11	1		87	104	17	
New Hampshire.....	449	453	4		25	24		1	424	429	5	
New Jersey.....	674	678	4		50	53	3		624	625	1	
New Mexico.....	96	102	6		1	1			85	101	16	
New York.....	2,869	2,920	51		174	186	12		2,685	2,734	49	
North Carolina.....	1,300	1,365	65		11	13	2		1,289	1,352	63	
Ohio.....	2,259	2,313	54		108	110	2		2,151	2,203	52	
Oregon.....	329	354	25		7	7			322	347	25	
Pennsylvania.....	3,290	3,333	43		125	130	5		3,165	3,203	38	
Rhode Island.....	109	110	1		11	11			98	99	1	
South Carolina.....	543	566	23		11	13	2		532	553	21	
Tennessee.....	1,238	1,316	78		17	16		1	1,224	1,300	76	
Texas.....	1,131	1,218	87		37	40	3		1,064	1,178	84	
Utah.....	190	198	8		3	4	1		187	194	7	
Vermont.....	493	494	1		19	21	2		474	473		1
Virginia.....	1,600	1,661	61		25	25			1,575	1,636	61	
Washington.....	171	200	29		3	3			168	197	29	
West Virginia.....	831	843	12		7	8	1		824	835	11	
Wisconsin.....	1,303	1,327	24		58	62	4		1,245	1,265	20	
Wyoming.....	55	60	5		3	3			52	57	5	
Total.....	39,258	40,855	1,597		1,570	1,711	143	2	37,679	39,144	1,468	3

REPORT

OF THE

SECOND ASSISTANT POSTMASTER-GENERAL.

4 P M

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REPORT

OF THE

SECOND ASSISTANT POSTMASTER-GENERAL.

POST-OFFICE DEPARTMENT,
OFFICE OF THE SECOND ASSISTANT POSTMASTER-GENERAL,
Washington, D. C., November 1, 1879.

SIR: At the close of the last fiscal year, June 30, 1879, the

ANNUAL COST OF INLAND TRANSPORTATION

was as follows, viz:

On 1,059 railroad routes, aggregating 79,991 miles in length.....	\$9,567,590
On 112 steamboat routes, aggregating 21,240 miles in length.....	754,388
On 9,225 other routes, designated as "star routes" aggregating 215,430 miles in length.....	6,401,830
Total cost.....	16,723,808

Compared with the state of the service at the close of the preceding year, the railroad routes show an increase of 59 routes in number, of 2,871 miles in aggregate length, and \$995 in annual cost. This small increase in cost is owing to the reduction in the rate of pay under act of June 17, 1878.

The steamboat routes show an increase in number of 6 routes, of 3,171 miles in aggregate length, whilst the increase in the annual cost is only \$1,095. This is owing, principally, to the mails being carried gratuitously on the route from Fernandina, Fla., to Brunswick, Ga., a distance of 40 miles, and from New Orleans, La., to Havana, Cuba, a distance of 832 miles.

The "star routes" show an increase of 414 in number, of 8,703 miles in aggregate length, and of \$686,887 in annual cost. Taken together, the increase in the number of routes was 479; in aggregate length, 14,745 miles; and in the annual cost \$689,787.

CONTRACTS.

Number of contracts drawn during the year ended June 30, 1879.....	8,000
Number of official and certified copies made during same period.....	200
Number redrawn on account of failures of contractors during same period.....	1,000
Total	9,200

RAILROAD SERVICE—ESTIMATE FOR 1881.

The cost of the transportation of mails by railroad for the fiscal year ended June 30, 1879, was at the rate of \$9,692,590.

The cost for the fiscal year ended June 30, 1878, was at the rate of \$9,566,595, the difference showing an increase for 1879 over 1878 of

\$125,995. This increase, however, does not represent the actual rate of increase in the service, as account must be taken of the reduction of 5 per cent. in the rate of compensation from July 1, 1878, made under act of June 17, 1878. The amount of this deduction is, in round numbers, \$400,000, making, with the \$125,995, an increase of \$525,995 for 1879 over 1878, being a little less than 5.5 per cent.

In the explanation, in the last annual report, of the estimates for the current fiscal year, allusion was made to the probable improvement of the business of the country, and its effect upon postal affairs.

It is gratifying to be able now to point to the general prosperity as an existing fact, and no longer an element of uncertainty.

Therefore, without argument as to the necessity of providing a greater rate of increase for the transportation of mails by railroad for 1881, than the actual increase for 1877, 1878, and 1879, the cost for that year is set down at \$10,000,000, which is an increase of a little over 11.11 per cent. The appropriation for railway post-office car service for 1880 is \$1,250,000, and the increase for this item is placed at the lower rate of 8 per cent., because the system, as now in operation, covers the greater number of cases where the most pressing need exists for such service, including the establishment of the system in Southern States from July 1, 1879, so that there remains at present no general system to be provided for in the estimate for 1881. This item is therefore placed at \$1,350,000.

THE SPECIAL FUND FOR PROPER FACILITIES.

Upon the enforcement of the law requiring a reduction of 10 per cent. in the compensation for carrying the mails on railroad routes from July 1, 1876, it was found that the companies rendering the most important postal service to the public, were disposed to lessen the accommodations already provided, and withhold the facilities necessary to a proper and expeditious performance of the service.

To meet this, Congress, on the 3d March, 1877, appropriated \$150,000 to be used by the Postmaster-General to obtain proper facilities on the trunk lines. The compensation to railroads was further reduced 5 per cent. from July 1, 1878, and the same act continued the appropriation for proper facilities.

By the use of this fund the department has succeeded in preventing any injury to the postal service on the most important lines, and in several cases has secured the running of special trains of great value to the business interests of the sections interested. As the compensation to railroads remains at the rates prescribed by act of June 17, 1878, it is manifest, considering the present state of values, that it is necessary that a sufficient special fund be provided for the maintenance of proper facilities for the ensuing fiscal year.

DELIVERY OF MAILS BY RAILROAD COMPANIES FROM STATIONS TO POST-OFFICES.

In the report for 1878 the questions of compensation for service on short routes and the delivery of mails from stations to post-offices were presented as proper subjects for the consideration of Congress, and reference is again made to these questions, because they stand in the way of an equitable adjustment of the compensation to railroad companies for carrying the mails.

PAY FOR CARRYING THE MAILS ON RAILROAD ROUTES.

The act of March 3, 1879, provides, "That the Postmaster-General shall request all railroad companies transporting the mails to furnish, under seal, such data relating to the operating, receipts, and expenditures of such roads as may in his judgment be deemed necessary to enable him to ascertain the cost of mail transportation and the proper compensation to be paid for the same, and he shall in his annual report to Congress make such recommendations, founded on the information obtained under this section, as shall in his opinion be just and equitable."

In compliance with this requirement, a letter was addressed to the railroad companies asking the following information :

First. The average number and length in feet and inches of the passenger-coaches, including sleeping-cars, run daily, except Sunday, in each direction over your lines.

Second. The (average) number and length, in feet and inches, of the cars or apartments used for baggage run over the road in each direction daily, except Sunday.

Third. The number and length, in feet and inches, of the cars or apartments used for express matter run over the road in each direction daily, except Sunday.

Fourth. The amount received for the transportation of passengers and the cost of running passenger-coaches.

Fifth. The cost of running cars or apartments for baggage.

Sixth. The amount received for the conveyance of express matter and the cost of running the cars or apartments devoted to the use of the same.

Seventh. The actual expenditure for the conveyance of mail between stations and post-offices where the latter are not over 80 rods distant from the former.

Eighth. Make separate statements of Sunday trains.

It will be noticed that the department, ignoring the questions of cost of construction, &c., has endeavored to ascertain the average amount of space used for the passenger business and the receipts and expenses attributable to the same, and thus to arrive at the rates of cost and profit per linear foot per mile run resulting from the passenger traffic, and with the view of submitting the same to Congress, as furnishing a just and equitable basis upon which to fix the rates of pay for the space used for mails and agents.

The companies have not generally replied, and such replies as have been received have not been arranged, because the pressure of current business has been so great as to prevent their consideration.

AUSTRALIAN MAILS.

For several years a heavy British mail, destined for Australia, has been included with the United States mails, and carried from New York across the continent to San Francisco; by the carrying of which the cost of the transportation of mails to this department has been increased at the rate of about one hundred thousand dollars per annum. And, while this sum has been included in the appropriations for railroad transportation, and appears to be an expenditure on account of our own mails, yet, through the competent representation of the interests of this country at the International Postal Congress, the exceptional character of the service rendered by this government in carrying the Australian mails as herein explained, has been recognized, and the British Govern-

ment has already paid into the United States Treasury the actual cost of doing the work, which to this time amounts to something over a quarter of a million dollars.

And, while this service does not appear as a credit to the item of railroad transportation, it is such in fact.

ADJUSTMENT OF RAILWAY PAY.

I again invite attention to the service performed by the division of "Railway Adjustment" in fixing the rates of pay for carrying the mails on nearly 80,000 miles of railroad, amounting to \$10,000,000 per annum, and covering every State in the Union, and conducting the correspondence incident thereto. The clerk in charge of this work receives \$1,800 per annum, while, in my opinion, the salary attached to the position should be not less than \$2,000 per annum, as "Superintendent of Railway Adjustment."

THE CHIEF CLERK.

The chief clerk of the contract office occupies a position which requires a superior order of executive ability, and involves great responsibility, as he is in fact deputy assistant postmaster-general, and is frequently and necessarily charged with the entire conduct of the affairs of the contract office. The salary attached to the position for twenty years has been \$2,000 per annum, which is considerably less than is paid to some of the chiefs of divisions of this department. And I have recommended that this salary be increased to \$2,500 per annum, which is less than the salaries fixed for similar positions in the Treasury Department and elsewhere.

STAR SERVICE.

Upon the application and recommendation of members of Congress, Army and other public officers, and State officers and citizens interested, the star service has been largely increased during the past year; and this action is justified by the large increase in the volume of mail-matter carried in consequence of the increased facilities for transportation, and the enlargement of the matter recently declared to be mailable, and the superior arrangements for its safety in transit.

DEFECTS IN PRESENT LAWS.

I desire to call particular attention to the existing laws, which have been in force many years, under which orders for increased frequency and increased speed are necessarily made. The section relating to increase of service is as follows, viz: "Compensation for additional service in carrying the mail shall not be in excess of the exact proportion which the original compensation bears to the original service, and when any such additional service is ordered the sum to be allowed therefor shall be expressed in the order and entered upon the books of the department; and no compensation shall be paid for additional regular service rendered before the issuing of such order."

That relating to allowance for increased celerity is as follows, viz: "No extra allowance shall be made for any increase of expedition in carrying the mail unless thereby the employment of additional stock and carriers is made necessary, and in such case the additional compensation shall bear no greater proportion to the additional stock and carriers necessarily employed than the compensation in the original con-

tract bears to the stock and carriers necessarily employed it its execution."

It is frequently the case in regions comparatively new that service is not required at the time of advertising more frequently than once or twice a week, and after the contract is entered into and the service is put in operation population centers along the line of the route, and more frequent service becomes a necessity. Under such circumstances it is clear that the rate that was reasonable for once or twice a week service through a sparsely settled region becomes a very unreasonable basis upon which to increase the service when the circumstances under which it is to be performed are entirely changed. I would therefore recommend that section 3960 be amended by adding after the semicolon following the word department the words "and the Postmaster-General may in his discretion relet the service by advertising for proposals for thirty days in the newspapers at the termini of the route, or if there be none published at those points, then in others in circulation in the region to be supplied with the mails; the service to be awarded to the lowest responsible bidder, as usual."

Under section 3961 allowances for increased speed are based upon the sworn statements of contractors showing the additional stock and carriers required. This practically makes a man and a horse of equal value as factors in determining the rate of increased compensation to be allowed. I would, therefore, recommend that allowance for increased speed be based upon the proportion the cost of performing the original service bears to the cost of the service at the increased speed; and that such additional allowances shall in no case be greater than 50 per centum of the original cost of the service. In case the cost of increased speed would amount to more than 50 per centum of the cost of the original service, the Postmaster-General shall readvertise for service with the increased speed; or, in his discretion, he may advertise in any case where increased speed is necessary. The advertisement to be inserted for not less than thirty days in newspapers published at the termini of the route, or in those published elsewhere having circulation along the line of the route, the contract to be awarded to the lowest responsible bidder, as usual.

This will accomplish, with but little delay, the desired improvement in the service, and with, I think, great advantage to the government.

INCREASE IN STAR SERVICE.

The estimates for the next fiscal year are made with a view to provide for the continuance of the present efficient service, and to afford largely increased service in the States of Indiana, Ohio, Kentucky, Tennessee, North Carolina, South Carolina, Georgia, Florida, Mississippi, and Alabama, which has already been advertised to go into effect July 1, 1880, and which will improve the present mail facilities.

The reason for advertising for the improved service is that it can be obtained at much less cost by so doing.

DEFICIENCIES.

Despite my effort to keep the cost of each item of inland transportation within each respective appropriation, there is an overexpenditure in the item of star transportation for the year ended June 30, 1879, of

about \$150,000, while there is a surplus in the appropriation for steamboat and railroad service amounting to about 250,000 dollars, so that the aggregate expenditures for transportation do not exceed the amount appropriated for "Inland mail transportation."

FAST MAIL TO HAVANA.

For several years there has been a growing demand, especially in commercial circles, for a fast-mail service to Havana, via Cedar Keys and Key West, and for improved mail connection with Mexican and South American ports, and last year an earnest effort was made to put the service into operation to Havana.

The effort failed, however, in consequence of the inadequacy of the compensation allowable for the proposed service under existing laws.

The enactment of a law authorizing the Postmaster-General to contract for service between such ports of the countries mentioned as will, in his judgment, be calculated to advance the interests of the people of the United States, at a sufficient rate of pay per mile per annum, will enable the department to put the desired service into operation.

MAIL-BAGS, MAIL-CATCHERS, ETC.

To supply the current wants of the mail-service during the year there were distributed, by the issuance of 5,708 drafts on the various depositories, 530,559 mail-bags, of which 88,194 were locked pouches and 442,365 were canvas mail-sacks; being, altogether, 42,060 in excess of the number distributed during the previous year. There were also distributed by drafts 301 mail-catchers. There were issued directly from this division, with instructions, 41,603 mail-locks, 3,861 mail-keys, 500 safety key-chains, 5,343 mail-bag label-cases, 2,002 brass registered mail-tags, and 12,000 mail-bag label-hooks.

It will be seen, by reference to the accompanying table (G), prepared for the appendix to the Postmaster-General's annual report, that the total number of new mail-bags purchased under contracts and put into service during the year was 104,021, of which 14,021 were locked pouches for first-class matter and 90,000 were canvas mail-sacks for printed and miscellaneous mail-matter; being, altogether, an increase, compared with the previous year, of 24,123 mail-bags; that the number of mail-catchers was 300; and that the total expense of mail-bags and mail-catchers, including repairs, &c., was \$170,266.26. The average annual cost of the last three preceding years was \$171,588.10.

The total number of mail-bags repaired during the year was 356,527, and the total cost of their repairs was \$37,613.10. Prior to the existing system of repairing mail-bags, the same repairs would have cost \$80,338.29; showing a saving of \$42,725.19 during the year by the present improved system of having such work done. In the last four years, since the old system was abolished, the present system of repairs has effected a total saving of \$192,282.06.

The total expense of mail-locks and keys during the year ended June 30, 1879, was \$12,780.55; the average annual cost for the last three preceding years having been \$12,021.66.

The accompanying table (H), prepared for the appendix to the Postmaster-General's annual report, exhibits an abstract of all contracts in operation during the year ended 30th June last for mail-bags, mail-catchers, mail-bag label-cases, and mail-bag tags.

The term of all contracts for mail-locks and keys expired during the preceding year. Supplies of such have since been kept up temporarily

by repairs and small purchases, made provisionally from the late contractors, as shown in detail by the table (G), before referred to.

The greater portion of the mail-locks now in use are nearly worn-out, and are becoming insecure from their long subjection to the peculiarly hard usage of the mail-service. "They were procured under contracts made in 1870, and will have soon fulfilled their allotted term of usefulness; ten years' service, as experience has hitherto shown, being the limit of duration for mail-locks, beyond which their further use is not reliable for requisite security. In the present state of the arts, it is probable locks of a new kind and different construction from the present mail-locks may be made to last longer, but it is not a property of the locks constructed and made up to the date when these were contracted for. Besides, the mail-locks and keys used on the general and the through mails, and above referred to as having been long in use, the particular kind of locks and keys now used to secure, in transit, the through-registered mails (now the chief medium of transmitting valuable mail-matter between large cities), though not so long in service as the other mail-locks, are now no longer adapted to the present enlarged and growing system of through-registered mails, which demands a new, different, and peculiar kind of locks, affording better security and greater facilities for dispatching mails of that highly important character.

It would be neither expedient nor practicable to replace the old locks now in service, to the extent which will soon be requisite, with new locks of the same kind or pattern; nor would it be practicable, without detriment to the service, to displace the old kinds of mail-locks and keys by small supplies of new kinds, introduced gradually. Consequently, it is expedient that a precedent supply of new kinds of locks and keys, equal in quantity to those in use, be contracted for, manufactured, and be in readiness for distribution, in order to substitute properly one kind for another.

The substitution for the present mail locks and keys of new locks and keys of entirely different construction, and unlike any others hitherto used or known in any way to impair their utility as mail locks and keys, is, in my judgment, a necessity of the service, to be provided for without any delay beyond the ensuing session of Congress. For, if during that session authority of law be given by the requisite appropriations for new kinds of mail locks and keys, probably no contract for them could be made to take effect until July 1, 1880, and one year or perhaps eighteen months therefrom would be required to manufacture, deliver, inspect, and have ready for distribution to all the postmasters in the United States; and adding thereto the time which must necessarily be consumed in distribution and substitution, the old locks and keys could not be superseded until some time in 1882 or 1883. And it is believed the old locks will not be reliable for the safety of the mails beyond that time.

FINES AND DEDUCTIONS.

The amount of fines imposed upon contractors and deductions made from their pay, for failures and other delinquencies for the fiscal year ended June 30, 1879, was \$177,098.57, and the amount remitted for the same period was \$16,571.76, leaving the net amount of fines and deductions \$160,526.81.

I have the honor to be, very respectfully, your obedient servant,

THOS. J. BRADY,

Second Assistant Postmaster-General.

Hon. DAVID M. KEY,
Postmaster-General.

Cost of inland transportation and the items incident thereto for the years 1878 and 1879, with the appropriation for 1880 and the estimates of the amounts necessary to be appropriated for 1881; showing the percentage of increase and decrease, with the cost, appropriation, and estimate for mail locks and keys, mail-bags, and mail-bag catchers.

Object.	Cost for 1878.	Cost for 1879.	Percentum increase or decrease of 1879 as to 1878.		Appropriation for 1880.	Percentum increase or decrease of appropriation of 1880 as to cost of 1879.		Estimate for 1881.	Percentum increase or decrease as to appropriation for 1880.	
			Increase.	Decrease.		Increase.	Decrease.		Increase.	Decrease.
Inland transportation, railroad routes.....	\$9,586,585 00	\$9,587,589 00	.009	.....	\$9,600,000 00	.....	4.36	\$10,000,000 00	11.11	.....
Railway post-office car-service.....	.....	.....	.....	.....	1,250,000 00	.....	.....	1,350,000 00	8.00	.....
For proper facilities on trunk lines.....	752,483 00	125,000 00	.....	.....	150,000 00	20.00	.....	1,400,000 00	8.00	.....
Inland transportation, steamboat routes.....	5,714,943 00	754,830 00	.25	.....	900,000 00	19.30	.....	900,000 00	168.67	.....
Inland transportation, "star" routes.....	1,290,560 00	1,272,290 00	12.05	.....	5,900,000 00	.....	7.83	7,375,000 00	25.00	.....
Railway post-office clerks.....	1,045,860 00	1,072,420 00	9	.....	1,350,000 00	5.52	.....	1,450,000 00	7.40	.....
Route-agents.....	162,066 00	167,649 00	3.43	.....	1,125,000 00	49.00	.....	1,225,000 00	8.88	.....
Mail-route messengers.....	105,520 00	112,531 00	6.63	.....	175,000 00	4.38	.....	200,000 00	14.28	.....
Local agents.....	659,497 00	664,174 00	7	.....	120,000 00	6.63	.....	150,000 00	25.00	.....
Mail-messengers.....	13,475 00	12,780 55	5.15	.....	675,000 00	17.37	.....	725,000 00	7.40	.....
Mail locks and keys.....	165,641 29	170,266 28	2.79	.....	185,000 00	8.65	.....	200,000 00	8.10	.....
Mail-bags and mail-bag catchers.....	.....	.....	.....	.....	20,845,000 00	.....	.....	24,125,000 00	15.73	.....
Total.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

NOTE.—The above estimates are based upon the contract prices and annual salaries, without reference to fines and deductions. This will explain the apparent discrepancy between this table and the Auditor's statement.

THOS. J. BRADY,
Second Assistant Postmaster-General.

POST-OFFICE DEPARTMENT,
OFFICE OF THE SECOND ASSISTANT POSTMASTER-GENERAL,
Washington, D. C., November 1, 1879.

SIR: For a statement of the mail-service for the contract year ended June 30, 1879, &c., I have the honor to refer you to the tables hereto annexed.

Table A exhibits the character of the service, the length of routes, the number of miles of transportation, and the cost thereof, at the close of the year.

Table B exhibits the railroad service as in operation on the 30th of June, 1879; also the cost per mile per annum in each State and Territory.

Table C exhibits the steamboat service, as in operation on the 30th of June, 1879.

Table D shows the increase and decrease of mail transportation, and cost in the several States and Territories, during the year ended June 30, 1879.

Table E shows the weight of the mails, the speed with which they are conveyed, the accommodations for mails and agents, the trips per week, and the rates of pay per mile per annum, on railroad routes in States in which the contract term expired June 30, 1879, and also in other States and Territories; the returns having been obtained with a view to the readjustment of pay in accordance with the act of March 3, 1873, and used also in accordance with the acts of July 12, 1876, and of June 17, 1878, in the case of readjustments taking effect on and after July 1, 1876. This table is accompanied with an alphabetical index of the titles of the companies carrying the mails.

Table F shows the readjustment of the rates of pay per mile on railroad routes in States and Territories in which the contract term expired June 30, 1879, and also in other States and on certain new routes; the adjustment of the rates based on returns of the weight of the mails, the speed with which they are conveyed, the accommodations for mails and agents, and the number of trips per week, in accordance with the act of March 3, 1873, and with the acts of July 12, 1876, and of June 17, 1878, in the case of readjustments taking effect on and after July 1, 1876. This table also is accompanied with an alphabetical index of the titles of the companies carrying the mails.

Table G is a statement of the number, description, and prices of mail-bags, mail-catchers, mail locks and keys purchased, and of the expense incurred on account thereof, during the fiscal year ended June 30, 1879.

Table H is a statement of all contracts in operation on the 30th of June, 1879, for mail-bags, mail-catchers, &c.

Table I is a list of railway post-office lines in the United States June 30, 1879, showing the increase and decrease in the service since June 30, 1878.

Table K is a consolidated statement, as given in tables K and L of my report of June 30, 1878, showing in detail the railway-mail service in operation on June 30, 1879.

Very respectfully, your obedient servant,

THOS. J. BRADY,
Second Assistant Postmaster-General.

HON. DAVID M. KEY,
Postmaster-General.

A.—Table of mail-service for the year ended June 30, 1879, as exhibited by the state of the arrangements at the close of the year authorized by the Postmaster-General.

[The entire service and pay on each route are set down to the State under which the route is numbered, though extending sometimes into other States, instead of being divided among the States in which the different portions lie.]

States and Territories.	Length of routes.	Annual transportation and cost.						Total annual transportation by express, certainty, and security.	Total annual transportation by steam.	Total annual transportation by rail.	Total annual transportation.	Total annual cost.
		By steamboat.		By railroad.								
		Miles.	Dollars.	Miles.	Dollars.	Miles.	Dollars.					
Maine.....	5,299	3,387	87,120	1,113	123,330	1,743,387	108,964	1,224,088	3,052,039	222,149		
New Hampshire.....	1,967	1,903	24,281	689	64,106	580,684	12,130	1,014,729	1,611,921	103,027		
Vermont.....	2,868	1,540	46,922	828	93,069	539,266	1,976	1,976,457	1,914,729	144,061		
Massachusetts.....	3,114	1,218	66,194	1,866	261,967	684,410	28,060	3,787,352	4,709,852	336,086		
Rhode Island.....	554	179	7,273	1,177	20,435	110,931	143,467	384,568	650,936	43,708		
Connecticut.....	1,845	775	29,996	1,070	176,189	496,816	75,069	2,283,969	2,740,255	206,186		
New York.....	12,450	6,106	237,155	6,112	1,297,475	2,297,092	75,069	11,114,086	14,726,997	1,432,981		
New Jersey.....	2,450	966	29,082	1,440	186,183	454,610	56,234	2,991,262	3,682,139	224,233		
Pennsylvania.....	14,294	9,144	288,612	5,062	618,520	8,941,668	56,234	7,934,199	11,521,091	867,632		
Delaware.....	7,465	1,168	5,548	277	19,413	91,871	182,849	2,308,454	349,625	24,981		
Maryland.....	3,663	1,827	50,463	1,180	241,677	1,082,057	192,849	2,308,454	3,554,172	313,720		
West Virginia.....	6,482	4,909	58,867	2,778	34,644	1,232,961	125,892	2,087,673	3,320,772	109,281		
Virginia.....	11,851	8,484	138,142	1,813	232,535	2,064,164	182,102	2,087,673	5,113,939	404,517		
North Carolina.....	11,241	9,351	111,266	1,409	103,967	1,972,874	98,800	1,255,837	3,334,401	225,256		
South Carolina.....	4,284	3,013	38,593	1,221	89,126	517,296	9,847	1,189,360	1,716,048	138,940		
Georgia.....	8,064	5,448	72,951	2,461	180,902	1,157,122	32,340	2,862,787	3,462,119	283,453		
Florida.....	7,696	2,763	40,281	4,456	93,276	477,196	723,232	441,954	3,462,119	153,066		
Alabama.....	10,196	7,363	113,648	2,009	147,656	1,366,457	133,648	2,074,679	3,795,064	275,046		
Mississippi.....	6,649	4,895	86,145	1,182	87,170	1,069,728	85,280	886,627	2,041,680	181,891		
Louisiana.....	6,296	3,707	191,785	1,905	102,096	848,469	617,608	478,063	2,444,710	248,669		
Texas.....	18,372	15,451	688,039	2,131	194,793	5,135,612	127,620	1,638,941	6,897,173	863,033		
Arkansas.....	10,549	7,045	171,431	4,463	39,478	2,194,267	544,060	3,916,849	7,093,596	324,967		
Missouri.....	15,366	10,426	212,075	4,207	580,579	2,040,237	179,460	3,916,849	7,093,596	708,904		
Tennessee.....	8,205	6,776	92,013	1,177	123,775	1,548,139	87,611	1,575,860	3,084,638	223,863		
Kentucky.....	9,077	6,590	101,597	1,473	184,959	1,728,968	486,862	1,575,860	3,084,638	315,366		
Ohio.....	12,762	8,379	147,066	6,157	1,078,663	2,266,568	166,870	3,062,719	11,216,414	1,438,541		
Indiana.....	7,873	4,951	63,252	3,296	340,874	1,931,366	397,688	7,042,719	9,338,092	424,126		
Illinois.....	12,181	8,866	136,749	7,263	888,670	2,066,084	7,094,045	7,094,045	9,338,092	963,813		
Michigan.....	9,043	4,008	107,000	3,931	268,021	1,077,968	4,576,264	6,321,070	9,338,092	415,300		
Wisconsin.....	6,043	4,008	97,888	2,843	268,390	1,077,968	4,576,264	6,321,070	9,338,092	415,300		
Iowa.....	11,213	7,263	147,623	3,931	268,390	1,077,968	4,576,264	6,321,070	9,338,092	415,300		
Minnesota.....	11,213	7,263	147,623	3,931	268,390	1,077,968	4,576,264	6,321,070	9,338,092	415,300		
Nebraska.....	7,192	4,483	131,716	1,063	123,424	1,063,436	1,126,076	1,126,076	2,116,083	244,601		

Kansas.....	12,724	9,899	169,069	.....	.....	.....	2,635	238,867	3,089,730	.....	2,347,711	5,317,431	438,066
Nevada.....	2,575	2,433	183,823	.....	.....	.....	143	9,569	1,014,896	.....	89,844	1,104,280	182,431
California.....	11,935	7,459	484,853	.....	1,740	43,590	2,737	481,969	2,859,875	307,918	1,899,103	6,136,366	912,323
Oregon.....	4,357	3,845	169,577	.....	216	12,477	274	22,944	1,067,563	134,032	170,907	1,374,563	204,986
Colorado.....	4,670	3,977	291,055	.....	.....	.....	763	50,410	1,527,770	.....	568,871	2,091,641	341,486
Washington Territory.....	2,899	1,185	87,816	.....	1,472	55,329	172	10,147	367,144	139,798	197,278	565,268	103,793
Idaho Territory.....	2,457	2,457	154,042	.....	.....	.....	.....	.....	890,776	.....	.....	890,776	154,042
Montana Territory.....	2,828	2,336	136,327	.....	.....	.....	.....	.....	923,848	.....	.....	923,848	136,327
Dakota Territory.....	3,898	2,836	168,173	.....	.....	.....	62	4,221	1,262,145	.....	38,507	1,240,683	172,894
Wyoming Territory.....	1,408	1,406	124,329	.....	.....	.....	.....	.....	1,623,687	.....	.....	1,623,687	124,329
Utah Territory.....	2,765	2,492	224,016	.....	.....	.....	373	21,116	1,283,445	.....	178,745	1,482,190	245,182
Utah Territory.....	2,598	2,856	140,451	.....	.....	.....	.....	.....	684,068	.....	.....	684,068	140,451
Indian Territory.....	2,084	2,604	233,529	.....	.....	.....	.....	.....	887,871	.....	.....	887,871	233,529
New Mexico Territory.....	2,862	2,862	186,467	.....	.....	.....	.....	.....	776,843	.....	.....	776,843	186,467
Arizona Territory.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total.....	316,711	215,460	6,401,830	21,240	754,388	79,991	9,567,580	69,343,839	167,432,805	5,091,674	98,062,992	1,722,898	1,722,898
Railway post-office clerks.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,272,280	1,272,280
Route agents.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,072,439	1,072,439
Mail-route messengers.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	167,649	167,649
Local agents.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	112,581	112,581
Mail-messengers.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	666,174	666,174
Aggregate.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	20,012,673	20,012,673

THOS. J. BRADY,
Second Assistant Postmaster-General.

B.—Railroad service as in operation on the 30th of June, 1879.

Number of route.	State and termini.	Corporate title of company carrying the mail.	Distance.	Total distance in each State.	Number of trips per week.	Annual pay.	Annual pay in each State.	Annual cost per mile on each route.	Remarks.
	MAINE.		Miles.	Miles.		Dollars.	Dollars.	Dollars.	
1	Augusta to Skowhegan.	Maine Central	19.21	19.21	12	5,465 10	.....	228 604	
2	Newport to Dexter.	do	18.76	18.76	12	636 97	.....	59 14	
3	Farmington to Brunswick.	do	14.9	14.9	12	5,553 02	.....	86 95	
4	Belfast to Burnham Village.	do	18.5	18.5	12	2,221 86	.....	76 95	
5	Portland to Bangor.	do	34.79	34.79	12	17,585 09	.....	63 864	
6	Portland to Augusta.	do	55.57	55.57	9	.....	.....	222 71	
7	Brunswick to Bath.	do	72.53	72.53	9	.....	.....	71 82	
8	Portland to Canada line.	Grand Trunk	11	11	204	17,227 28	.....	267 17	
9	Portland to Rochester, N. H.	Portland and Rochester.	52.28	52.28	18	.....	.....	257 764	
10	Portland to Portsmouth, N. H.	Eastern	9.05	9.05	18	13,650 73	.....	82 06	
11	Portland to Lunenburg Station, Vt.	Portland and Ogdensburg.	56.42	56.42	12	7,007 10	.....	134 83	
12	Salmon Falls, N. H., to Portland, Me.	Boston and Maine	52.56	52.56	194	13,233 55	.....	231 78	
13	Bangor to Vancorbrough.	European and North American.	114.05	114.05	12	10,080 88	.....	88 39	
14	Old Town to Blackland.	do	45	45	12	7,429 05	.....	165 09	
15	Woolwich to Rockland.	Bangor and Piscataquis.	113.83	113.83	6	18,065 73	.....	163 834	
16	Houlton to New Brunswick Line.	Knox and Lincoln	19.80	19.80	12	1,610 39	.....	80 964	
17	Gales to Princeton.	New Brunswick and Canada.	63.8	63.8	6	3,854 78	.....	57 284	
18	West Waterville to North Anson.	Saint Croix and Penobscot.	48.86	48.86	12	4,321 93	.....	88 66	
19	Mechanic Falls to Canton.	Somerset	3.83	3.83	6	171 36	.....	43 604	
		Rumford Falls and Buckfield	21.29	21.29	6	738 12	.....	34 20	
			25.7	25.7	6	1,230 52	.....	47 83	
			27.71	27.71	6	1,243 85	.....	45 00	Pay estimated.
				1,112.06		182,330 38	.....	
	NEW HAMPSHIRE.								
1001	Concord to Nashua.	Concord	36.26	36.26	274	8,022 59	.....	221 13	
1002	Concord to Portsmouth.	do	66.16	66.16	12	3,333 30	.....	24 43	
1003	Manchester to North Weymouth.	do	13.86	13.86	12	832 86	.....	43 76	
1004	Manchester to Pittsfield.	do	20.35	20.35	6	994 76	.....	44 46	
1005	Concord to Wells River, Vt.	Boston, Concord and Montreal.	51	51	134	11,023 75	.....	131 41	
1006	Concord to Wells River, Vt.	do	43.01	43.01	12	.....	.....	131 41	
			26.12	26.12	12	4,723 36	.....	82 06	

Year	Location	Pay estimated on 17.76 miles.	Pay estimated.
1907	Wing Road to Fabyan House.	12.5	608.46
1908	Concord to White River Junction, Vt.	69.64	186.81
1909	Branch, Franklin to Bristol.	13.11	42.75
1910	Concord to Claremont Junction.	56.8	51.17
1911	Concord to Peterboro Junction.	32.76	1,562.29
1912	Concord to Lowell and Nashua and Lowell.	28.58	1,681.71
1913	Nashua to Rochester.	49.4	6,829.25
1914	Dover to Alton Bay.	28.42	1,572.05
1915	Brock's Crossing, Me., to North Conway, N. H.	71.11	5,228.71
1916	Wolfborough Junction to Wolfborough.	12.11	517.70
1917	Portsmouth to Dover.	11.6	486.90
1918	Greenfield to Keene.	29.91	1,345.95
1919	Central Vermont.	698.81	66,105.75
1920	Burlington to Rouse's Point, N. Y.	24.5	8,261.31
1921	Windsor to Burlington.	32.65	123.12
1922	Branch, Montpelier to Barre.	97.2	191.07
1923	Bellows Falls to Burlington.	22.67	141.07
1924	Bellows Falls to Windsor.	6.76	42.75
1925	Brattleboro to Bellows Falls.	120.27	144.10
1926	Brattleboro to Concord line.	28.34	151.82
1927	Saint Albans to Keene.	24.46	156.20
1928	Saint Albans to Keene.	17.1	62.41
1929	Leicester Junction to Concord.	28.47	47.08
1930	Station, N. Y.	13.6	42.75
1931	Richford to Newport.	31.95	84.12
1932	White River Junction to Derby Line.	114.3	135.78
1933	Lunenburg Junction to Swanton.	118.14	67.54
1934	Wells River to Montpelier.	38.78	86.35
1935	White River Junction to Woodstock.	14.41	42.75
1936	Burlington to Cambridge Junction.	34.97	45.31
1937	Rutland to Bennington.	57.16	101.74
1938	Branch, North Bennington to State line.	1.85	112.00
1939	Massachusetts.	827.58	95,068.75
1940	Boston to Portsmouth, N. H.	57.28	276.31
1941	Boston to West Lynn Depot.	11.6	42.75
1942	Salem to Rockport.	20.69	47.02
1943	Salem to Marblehead.	4.49	46.17
1944	Salem to Lawrence.	18.01	42.75
1945	East Salisbury to Amesbury.	3.9	42.75
1946	Wenham to Essex.	5.54	42.75

B.—Railroad service as in operation on the 30th of June, 1879—Continued.

Number of route.	State and termini.	Corporate title of company carrying the mail.	Distance.	Total distance in each State.	Number of trips per week.	Annual pay.	Annual pay in each State.	Annual cost per mile on each route.	Remarks.
MASSACHUSETTS—Continued.									
3009	Lynn to Marblehead	Eastern	6.16	Miles.		Dollars.	Dollars.	Dollars.	
3010	Walden to Falmouth	do	9.08		6	358 15		58 14	
3011	Boston to Salmon Falls, N. H. ... Branch, Rollingsford to Great Falls.	Boston and Maine	71.5 2.5		18	388 17		42 75	
3012	Boston to Medford	do	5.31		18	13,377 99		42 75	
3013	Georgetown to Haverhill	do	7.45		6	227 00		34 20	
3014	Walden to Newburyport	do	31.36		12	254 79		42 75	
3015	Newton Depot, N. H., to Merrimac, Mass.	do	4.83		12	1,840 64		42 75	
3016	Boston to Nashua, N. H.	Boston and Lowell and Nashua and Lowell.	39.87		27½	208 48		216 72½	
3017	Lowell to Lawrence	do	13.08		16½	8,640 82		43 75	
3018	Winchester to Woburn	do	2.18		18	559 17		42 75	
3019	Somerville Station to Concord	do	16.61		12	93 20		42 75	
3020	Ayer to Lowell	do	16.39		12	710 08		43 75	
3021	Boston to Greenfield	Fitchburg	49.6		16½	1,130 83		68 99½	
3022	Greenfield to North Adams ... Branch, Greenfield to Turner's Falls.	do	54.11 4.37		18	202 31½		186 92½	
3023	South Acton Depot to Hudson	do	9.19		12	20,522 18		43 75	
3024	Ayer to Greenfield, N. H.	do	23.5		12	7,125 48		43 75	
3025	Boston to Albany, N. Y.	Boston and Albany	94.38		41½	262 87		518 04	
3026	Grafton Depot to Milbury	do	103.86		41½	80,263 16		292 99½	
3027	Albursdale Station to Newton	do	4.46		9	190 67		43 75	
3028	Lower Falls	do	2.2		12	94 05		43 75	
3029	South Framingham to Milford	do	12.3		12			45 31½	
3030	Pittsfield to North Adams	do	20.44		24	1,557 37		57 39½	
3031	Pittsfield to Westfield	do	20.45		24	1,170 90		44 49	
3032	North Brookfield to East Brookfield	Boston and Albany, lessee	4.28		10½	2,267 44		43 75	
3033	North Brookfield to East Brookfield	do	4.28		12	183 97		43 75	
3034	North Brookfield to East Brookfield	do	4.28		12			43 75	
3035	North Brookfield to East Brookfield	do	4.28		12			43 75	
3036	North Brookfield to East Brookfield	do	4.28		12			43 75	
3037	North Brookfield to East Brookfield	do	4.28		12			43 75	
3038	North Brookfield to East Brookfield	do	4.28		12			43 75	
3039	North Brookfield to East Brookfield	do	4.28		12			43 75	
3040	North Brookfield to East Brookfield	do	4.28		12			43 75	
3041	North Brookfield to East Brookfield	do	4.28		12			43 75	
3042	North Brookfield to East Brookfield	do	4.28		12			43 75	
3043	North Brookfield to East Brookfield	do	4.28		12			43 75	
3044	North Brookfield to East Brookfield	do	4.28		12			43 75	

3035	Boston to Providence, R. I.	44.19	36	0, 970 37	225 62½
3036	Boston to Dedham	10.45	18	446 74	42 75
3037	Canton Depot to Sloughton	4.15	18	177 42	42 75
3038	{ Boston to Plymouth Branch, Atlantic to West Quincy.	{ 37.27 3.17	{ 22½ 12 }	{ 4, 756 06 8, 065 85	{ 123 97½ 90.18 }
3039	South Braintree Junction to New- port, R. I.	61.16	13½		
3040	South Abington to Bridgewater.	7.07	12	302 24	42 75
3041	Middleborough to Hyannis	46.29	12	5, 912 84	130 55½
3042	Yarmouth Port to Provincetown	31.07	12	311 74½	{ 111 74½ 101 74 }
3043	Taunton to Middleborough	14.08	12	4, 904 48	42 75
3044	South Braintree Junction to Fall River.	11.71	24	500 61	42 75
3045	Cohasset Narrows to Wood's Holl. Junction.	34.36	18	1, 703 91	49 50
3046	South Framingham to Prati's New Bedford.	17.92	6	888 65	49 50
3047	Sterling Junction to Fitchburg	26.74	20	2, 186 78	73 53
3048	Mansfield to South Framingham	14.15	29½	967 86	68 40
3049	South Framingham to Lowell	22.02	12½	1, 632 23	74 12½
3050	Fairhaven to West Wareham	28.44	12	2, 013 70	68 40
3051	{ New Bedford to Mansfield Junc- tion.	{ 15.68 21.53	{ 13½ 33½ }	{ 670 32 2, 610 79	{ 42 75 74 36½ }
3052	Taunton to Attleborough	10.93	18	380 30	{ 92 34 34 20 }
3053	New Bedford to Fall River	11.12	18	641 25	42 75
3054	South Vernon Junction, Vt., to Keene, N. H.	15	20	1, 323 68	54 72
3055	Fitchburg to Bellows Falls, Vt.	24.19	12	7, 738 60	119 70
3056	Worcester to W. Litchendon	64.65	18	2, 917 28	76 60
3057	Winchendon to Peterborough, N. H.	38.04	12	933 50	57 02½
3058	Milford to Bellingham	16.37	12	175 28	42 75
3059	Milford to Andover	4.1	12	513 86	42 75
3060	Palmer to Miller's Falls	12.02	12	3, 360 60	67 54½
3061	Miller's Falls to Frattborough, Vt.	34.95	18	3, 089 20	144 40½
3062	Lawrence to Manchester, N. H.	21.38	12	3, 579 22	132 27
3063	Braintree Depot to Cohasset	27.06	12	655 15	56 43
3064	Cohasset to South Duxbury	11.61	6	753 68	42 75
3065	Worcester to Nashua, N. H.	46.54	18	7, 150 40	153 64
3066	{ Springfield, Vt. Junction, to South Vernon }	{ 46.54 50.46	{ 23½ 23½ }	{ 9, 594 34 2, 682 60	{ 182 65 153 90 }
3067	Springfield to Athol	48.27	6		{ 55 57½ 52 75 }
3068	Holyoke to Westfield	10.53	12	555 46	42 75
3069	Ashburnham Depot to Ashburn- ham.	2.80	18	123 55	
3070	Boston to Waltham	10.9	6	490 50	45 00
3072	Fitchburg	1, 866 23		261, 906 80	Pay estimated.

B.—Railroad service as in operation on the 30th of June, 1879—Continued.

Number of route.	State and termini.	Corporate title of company carrying the mail.	Distance.	Total distance in each State.	Number of trips per week.	Annual pay.	Annual pay in each State.	Annual cost per mile on each route.	Remarks.
			<i>Miles.</i>			<i>Dollars.</i>	<i>Dollars.</i>	<i>Dollars.</i>	
	RHODE ISLAND.								
4001	Providence to Worcester, Mass.	Providence and Worcester	44.17	.....	24	4,256 00	.....	96 35 $\frac{1}{2}$	
4002	Providence to Groton, Conn.	New York, Providence, and Boston	62.57	.....	31 $\frac{1}{2}$	12,811 52	.....	204 75 $\frac{1}{2}$	
4003	Wickford Landing to Wickford Junction.	New York and Wickford Railroad	3.4	.....	15 $\frac{1}{2}$	165 70	.....	48 73 $\frac{1}{2}$	
4004	Providence to Bristol	Providence and Steamboat Company	15.75	.....	12	929 17	.....	58 99 $\frac{1}{2}$	
4005	Warren to Fall River, Mass.	Providence, Warren, and Bristol	9.99	.....	6	452 69	.....	45 31 $\frac{1}{2}$	
4006	Providence to Pascoag	Fall River, Warren and Providence	23.43	.....	12	1,001 68	.....	42 75	
4007	Kingston Depot to Narragansett Pier.	Providence and Springfield	9.14	.....	15	421 99	.....	46 17	
4008	River Point to Hope	Narragansett Pier	3.1	.....	6	132 52	.....	42 75	Pay estimated.
4009	Wood River Junction to Hope Valley.	Pawtuxet Valley	5.87	.....	6	264 15	.....	45 00	
		Wood River Branch		171.42		20,435 37			
	CONNECTICUT.								
5001	Norwich to Worcester, Mass.	New York and New England, Inc.	59.65	.....	18	4,896 07	.....	82 08	
5002	Rail Thompson to Willimantic.	New York and New England	33.21	.....	21	5,159 17	.....	155 35	
5003	Middletown to Berlin Depot.	New York, New Haven and Hartford	11.15	.....	18	505 26	.....	45 31 $\frac{1}{2}$	
5004	New Haven to New London.	do	51.71	.....	31	13,016 69	.....	251 72 $\frac{1}{2}$	
5005	New York, N. Y., to Springfield, Mass.	do	73.23	.....	52 $\frac{1}{2}$	87,299 15	.....	731 01 $\frac{1}{2}$	
		Branch, Windsor Locks to Suffield.	62.86	.....	52 $\frac{1}{2}$		.....	538 20	
5007	Waterbury to Providence, R. I.	do	4.79	.....	12	9,460 23	.....	49 75	
5008	Warren Depot to Rockville	New York and New England	122.94	.....	14 $\frac{1}{2}$	9,460 23	.....	76 96	
5009	New London to Palmer, Mass.	do	4.54	.....	19	4,194 08	.....	42 75	
		Central Vermont	65.27	.....	21	4,520 27	.....	69 25 $\frac{1}{2}$	
5010	New Haven to Williamsburgh, Mass.	do	85.82	.....	18	11,274 81	.....	123 06 $\frac{1}{2}$	
		New Haven and Northampton	14.32	.....	18		.....	56 17	
5011	Providence to Woonsocket, R. I.	Narragansett Pier	62.28	.....	12	6,173 59	.....	94 99 $\frac{1}{2}$	
		Branch, Waterbury to Waterbury	6.15	.....	12		.....	43 75	

5012	Bridgeport to Pittsfield, Mass., Branch, Van Dusenville to State Line.	110.55 11.05	12 6	11, 110 20	93 79 42 75
5013	Branch, Danbury to Brookfield Junction. Branch, Branchville to Ridge- field. Branch, Branchville to Danbury. Gold.	6.3 23.65 4.34	18 17 14	2, 234 53	42 75 79 51 1/2 42 75
5014	Branch, Bethel to Hawleyville. New Haven to Willimantic.	6.28 64.14	6 16 1/2	7, 822 96	42 75 144 49 1/2
5015	Hartford to Springfield.	44.15	12	2, 831 11	64 12 1/2
5016	Hartford to Springfield, Mass.	31.67	6	1, 976 68	62 41 1/2
5017	New Haven to Ansonia.	18.42	12	711 39	53 01
5018	Hartford to Millerton, N. Y.	68.93	13	5, 422 72	77 54 1/2
5019	Litchfield to Hawleyville.	32.78	9 1/2	1, 401 34	42 75
5020	Turnerville to Colchester.	4.19	6	179 12	42 75
		1, 069.87		176, 189 37	
NEW YORK.					
6001	New York to Dunkirk.	332	21 1/2	122, 294 79	277 50 1/2
6002	Suffern to Piermont.	127	21 1/2	769 50	237 50 1/2
6003	Buffalo to Suspension Bridge.	18	9	1, 108 93	42 75
6004	Northburgh to Chester. Branch, Vail's Gate Junction to Junction with main stem.	25.94 19.75 12.75	19 1/2 20 1/2	1, 657 42	58 01 47 88
6005	Rochester to Avon.	18	22	1, 277 37	70 94 1/2
6006	Avon to Danbury.	30.73	15	1, 412 91	58 90 1/2
6007	Attica to Corning.	111	31 1/2	9, 680 31	87 21
6008	Buffalo to Hornellsville.	91	29 1/2	13, 382 46	147 04
6009	Goshen to Montgomery.	10.25	9	582 11	53 94 1/2
6010	Goshen to Pine Island.	11	12	470 25	42 75
6011	New York to Troy. New York Central and Hudson River.	144 6 56 1/2	56 1/2 6 23	128, 949 42	888 82 139 84 101 74 1/2
6012	Troy to Schenectady.	22	23	2, 288 39	129 96
6013	Schenectady to Rochester.	104	27 1/2	13, 513 84	42 75
6014	Canastota to Tonawanda.	86	6	3, 676 50	42 75
6015	Buffalo to Lockport.	22	12	2, 940 50	42 75
6016	Buffalo to Lewiston.	29	24	2, 405 11	82 83 1/2
6017	Albany to Buffalo.	228	13 1/2	278, 352 06	944 47 914 47
6018	Rochester to Niagara Falls.	76	13 1/2	10, 666 72	140 22
6019	Dunkirk to Titusville, Pa.	91.16	32 1/2	4, 442 67	48 73 1/2
6020	Third Street, New York City to Spuyten Duyvil.	10	6	4, 427 50	42 75
6021	Rochester to Charlotte.	9	18	415 53	46 17
6022	New York to Chatham Village.	130.5	11 1/2	12, 337 21	90.63
6023	Golden's Bridge to Mahopac.	7.5	6	230 62	42 75

\$500 per annum included for
transporting messengers to
Fortham.

B.—Railroad service as in operation on the 30th of June, 1879—Continued.

Number of route.	State and termini.	Corporate title of company carrying the mail.	Distance. Miles.	Total distance in each State.	Number of trips per week.	Annual pay. Dollars.	Annual pay in each State. Dollars.	Annual cost per mile on each route.	Remarks.
NEW YORK—Continued.									
6024	Eagle Bridge to Rutland, Vt.	Delaware and Hudson Canal Company.	62.87	Miles.	6	Dollars 4,515 32	Dollars.	Dollars. 71 82	
6025	Schenectady to Ballston	do.	15.21	18	18	650 23		42 75	
6026	{ Albany to Canada line	do.	191.37	18	18	20,071 72		129 10	
6027	{ Branch, Whitehall to Castleton.	do.	6.2	16	16			72 67	
6028	{ Cohoes to Cherry Valley	do.	22.85	6	6	978 83		66 69	
6029	{ Albany to Binghamton	do.	143.23	18	18	11,756 31		42 75	
6030	{ Plattsburgh to An Sable Forks	do.	23.52	6	6	1,005 45		82 08	
6031	{ Quaker Street to Schenectady	do.	14.72	12	12	1,566 35		42 75	
6032	{ Nineveh Junction to Jefferson Junction.	do.	21	6	6	897 75		38 47	
6033	Port Edward to Glen's Falls	do.	6.31	18	18	323 70		42 75	
6034	West Chazy to Rouse's Point	do.	14.78	12	12	1,380 06		51 80	
6035	Chenango to Richland	Rome, Watertown and Ogdensburg.	28.5	6	6	1,851 93		94 05	
6036	{ Watertown to Cape Vincent	do.	28	12	12	1,422 72		64 86	
6037	{ Rome to Ogdensburg	do.	73	18	18			54 72	
6038	{ Branch, De Kalb Junction to Norwood.	do.	69	12	12	20,058 30		132 52	
6039	{ Syracuse to Pulaski	do.	25	6	6			132 52	
6040	{ Oswego to Lewiston	do.	38.42	6	6	2,900 88		49 50	
6041	{ Watertown to Sacket's Harbor	do.	46.92	6	6	8,067 54		57 24	
6042	{ Chenango Forks to Norwich	Utica and Black River	12.51	12	12	534 80		58 99	
6043	{ Utica to Norwich	Delaware, Lehigh and West-ern.	30.69	12	12	2,353 61		42 75	
6044	{ Oswego to Ithaca	do.	54.5	12	12	5,111 55		76 69	
6045	{ Cassville Junction to Richfield Springs.	do.	21	12	12	2,423 92		83 79	
6046	{ Minerva to Lacquet Valley	do.	12.25	12	12	951 61		69 25	
6047	{ Long Island City to Greenport.	Long Island	94.31	12	12	523 69		45 31	
6048	{ Branch, Minerva to Hempstead.	do.	2.5	12	12	7,847 84		42 75	
6049	{ Hicksville to Port Jefferson	do.	15.5	13	13	2,006 24		82 08	
6050	{ Massenville to Sag Harbor	do.	20	12	12			60 44	
6051	{ Chicago to Milwaukee	do.	85.25	6	6	1,748 05		50 44	
6052	{ Chicago to St. Louis	New York and Oswego Midland	240.2	6	6	13,177 26		49 59	
6053	{ Chicago to St. Louis	do.	240.2	6	6			51 80	
6054	{ Chicago to St. Louis	do.	240.2	6	6			42 75	

B.—Railroad service as in operation on the 30th of June, 1879—Continued.

Number of route.	State and termini.	Corporate title of company carrying the mail.	Distance. Miles.	Total distance in each State. Miles.	Number of trips per week.	Annual pay. Dollars.	Annual pay in each State. Dollars.	Annual cost per mile on each route. Dollars.	Remarks.
NEW YORK—Continued.									
6086	Cooperstown to Cooperstown Junction.	Cooperstown and Susquehanna Valley.	16	16	12	738 72	738 72	46 17	
6087	Utica to Watertown.	Utica and Black River.	92 22	92 22	13	6,307 85	6,307 85	68 40	
6088	Carthage to Ogdensburg. { Branch, Theresa Junction to Clayton.	do	61 25	61 25	12			58 14	
			16 25	16 25	6	4,255 75	4,255 75	42 75	Pay on 11.17 miles estimated.
6089	Carthage to Ithaca.	Cayuga Southern.	38 05	38 05	9	1,886 90	1,886 90	49 59	
6090	Sodus Point to Gorham Station.	Ontario Southern.	34	34	6	1,453 50	1,453 50	42 75	
6091	Buffalo to Jamestown.	Buffalo and Southwestern.	71 09	71 09	12	4,600 84	4,600 84	64 72	
6092	Middletown to Pine Bush.	Middletown and Crawford.	13 5	13 5	6	577 12	577 12	42 75	
6093	Long Island City to Babylon.	Southern Railroad Company of Long Island.	37 08	37 08	12	1,902 20	1,902 20	51 30	
6094	Long Island City to Patchogue. { Branch, Flushing to Whitestone Branch, Great Neck Junction to Great Neck.	Flushing, North Shore and Central.	53 46	53 46	11	2,744 55	2,744 55	42 75	
6095	Saratoga Springs to North Creek.	Adirondack.	6 74	6 74	6	3,865 35	3,865 35	66 09	
6096	Bath to Hammondport.	Bath and Hammondport.	57 96	57 96	18	4,401 85	4,401 85	42 75	
6097	Rhinecliff to Boston Corner.	Rhinebeck and Connecticut.	9 4	9 4	6	1,504 80	1,504 80	42 75	
6098	Queensville to Northville.	Gloversville and Northville.	35 2	35 2	12	1,188 78	1,188 78	66 99	
6099	Crown Point to Hammondville.	Crown Point Iron Company.	17 875	17 875	6	404 24	404 24	34 20	
6100	Valley Stream to Oceans.	Long Island.	11 82	11 82	6	327 04	327 04	38 47	
6101	Sidney Plains to New Berlin.	New York and Oswego Midland.	24 84	24 84	6	1,061 91	1,061 91	42 75	
6102	Rochester to Salamanca.	Rochester and State Line.	108 92	108 92	6	6,053 22	6,053 22	55 57	
6103	Corning to Genesee.	Fall Brook Coal Company.	62 41	62 41	6	4,909 17	4,909 17	78 66	
6104	Springville to Sardis Junction.	Springville and Sardis.	11 59	11 59	6	463 80	463 80	40 00	Pay estimated.
6105	Plattsburgh to Dannemora.	Plattsburgh and Dannemora.	17 69	17 69	6	786 05	786 05	45 00	Do.
				6,112 635		1,207,475 44	1,207,475 44		
NEW JERSEY.									
7001	New York, N. Y., to Easton, Pa.	Central Railroad Company of New Jersey.	74	74	12	10,073 30	10,073 30	144 23	
7002	Sumerville to Flemington.	do	16 06	16 06	6	617 91	617 91	38 47	
7003	Elizabethport to New Plain.	do	47 9	47 9	12	2,825 86	2,825 86	58 99	
7004	New York, N. Y., to Philadelphia.	do	90	90	12			1,210 66	

Station	Line	3.2	12	100,335 90	47 024
Phila. Pa. Branch, Princeton Junction to Princeton.	Pennsylvania	3.2	12	100,335 90	47 024
Branch, Frankford Junction to Kensington Station.	do	2.95	18		76 95
Branch, Berdentson to Trenton Branch, Juncaburgh to South Aulney.	do	53.56	204		67 541
do	do	7	18	4,516 10	46 17
do	do	14.95	9		38 471
Camden to Hightstown	do	51.75	154	3,141 48	60 704
Burlington to Medford	do	18.5	15	577 12	42 75
Trenton to intersection with Del- aware, Lackawanna and West- ern Railroad.	do	68.7	134	5,168 99	75 24
Lambertville to Philadelphia	do	12.13	12	518 56	42 75
Greensburgh Station to New Brunswick.	do	29.13	13	1,120 77	38 471
Rocky Hill to Monmouth Junc- tion.	do	8	12	342 00	42 75
Kirkora to Lovelock	do	10.81	15	462 13	42 75
Hoboken to Easton, Pa.	Morris and Essex	84.24	144	10,925 93	120 70
Dover to Chester	do	10	9	427 50	42 75
Camden to Atlantic City	Camden and Atlantic	60		3,744 90	62 411
Egg Harbor City to May's Landing	do	7.43	12	317 63	42 75
Jersey City to Nyack, N. Y.	Northern Railroad Company of New Jersey.	28.71	6	1,374 63	47 88
Elmer to Salem	West Jersey	16.6	6	752 23	45 314
Woodbury to Swedesborough	do	11	6	470 25	42 75
Jamesburgh to Sea Girt	do	27.7	12	1,349 96	48 734
Jersey City to Stony Point, N. Y.	Freehold, Jamesburgh and Agri- cultural.	42.81	12	1,830 13	42 75
Watson to Franklin Furnace	New Jersey and New York.	11.76	19	54 46	54 46
Branch, La Fayette Junction to Branchville.	Sussex	13	9	44 46	44 46
Sandy Hook to Pemberton Junc- tion.	do	6.24	9	42 75	42 75
Branch, Eastontown to Port Mon- mouth.	do	11.4	12	63 27	63 27
Branch, Manchester to Barnegat Junction.	do	53.6	6	63 27	63 27
Newark and Bloomfield	New Jersey Southern	9.8	6	42 75	42 75
Delaware, Lackawanna and West- ern.	do	20.3	12	48 734	48 734
New Jersey Southern	do	5.67	12	242 39	42 75
New York, Lake Erie and West- ern.	do	34.15	12	3,962 08	116 02
Whiting to Atco	do	33.3	74	1,281 22	38 471
Newark to Paterson	do	13.12	12	560 88	42 75
Atsion to Bridgeton	do	37.75	6	1,452 43	38 471
Whiting to Long Branch	do	38.06	12	2,007 66	52 75
Bridgeton to Port Norris	do	20.24	94	865 28	42 75
Jersey City to Greenwood Lake, N. Y.	do	46.9	6	1,804 48	38 471

{ 12 trips a week for 8 months.
19 trips a week for 4 months.

B.—Railroad service as in operation on the 30th of June, 1879—Continued.

Number of route	State and termini.	Corporate title of company carrying the mail.	Distance.	Total distance in each State.	Number of trips per week.	Annual pay.	Annual pay in each State.	Annual cost per mile on each route.	Remarks.
			Miles.	Miles.		Dollars.	Dollars.	Dollars.	
NEW JERSEY—Continued.									
7035	Atton to Williamstown	Williamstown	9	.....	12	307 80	.....	34 20	
7036	Summit to Bernardsville	Passaic and Delaware	14 78	.....	6	631 84	.....	42 75	
7037	Jersey City to Middletown, N. Y.	New Jersey Midland	88	.....	64	3,912 48	.....	44 46	
7038	Railway to Perth Amboy	Pennsylvania	7 45	.....	6	318 49	.....	42 75	
7039	Woodbury to Fort Grove	Delaware Shore	20 47	.....	42	787 58	.....	38 47 1/2	
7040	High Bridge to Port Oran	Central Railroad Company of New Jersey.	25 32	.....	6	974 19	.....	38 47 1/2	
7041	Camden to Cape May	West Jersey	82 02	.....	12	7,457 22	.....	70 11	
7042	Branch, Glassborough to Bridge- ton.	Blairstown	20 37	.....	12	483 07	.....	83 79	
7043	Delaware Station to Blairstown.	Freehold and New York	11 3	.....	6	604 48	.....	42 75	
7044	Keyport to Freehold	.....	14 14	.....	6	.....	.....	42 75	
				1,440 27		196,153 01			
PENNSYLVANIA.									
8001	Philadelphia to Pittsburgh	Pennsylvania	253 8	.....	42	305,024 20	.....	862 62 1/2	
8002	Philadelphia to Pottsville	Philadelphia and Reading	82 35	.....	174	1,599 35	.....	102 02	
8003	Philadelphia to West Chester	West Chester and Philadelphia	26 35	.....	24	1,862 57	.....	75 24	
8004	Philadelphia to Bethlehem	North Pennsylvania	54 49	.....	62	8,118 98	.....	140 22	
8005	Branch, Lansdale to Joystown	Philadelphia and Reading	10 66	.....	72	915 76	.....	45 31 1/2	
8006	Philadelphia to Norristown	Philadelphia and Darby	16 43	.....	172	280 87	.....	49 50	
8007	Philadelphia to Duncannon	Philadelphia and Reading	7 56	.....	9	632 21	.....	38 47 1/2	
8008	Bridgeport to Downingtown	Philadelphia and Reading	21 63	.....	12	4,959 22	.....	83 70	
8009	Chester to Fort Deposit, Md.	Philadelphia and Baltimore Central	59 25	.....	12	1,134 68	.....	45 31 1/2	
8010	Monaca to Lackawanna	New York, Lake Erie and Western.	25 04	.....	12	25,122 70	.....	132 52 1/2	
8011	East Penn Junction to Waverly, N. Y.	Lehigh Valley	189 57	.....	154	2,258 91	.....	42 75	
8012	Town Haven Junction to Mount Carmel	.....do	52 84	.....	94	363 37	.....	42 75	
8013	Maize Creek Bridge to Audenried and Treckow.	.....do	8 5	.....	6	.....	.....	42 75	
8014	Pottsville to Herndon	Philadelphia and Reading	59 76	.....	104	4,811 91	.....	59 50	
8015	Port Clinton to Williamsport	.....do	21 19	.....	104	5,407 67	.....	44 46	
8016	Scrubby to Tonawanda	Pennsylvania	121 63	.....	74	1,885 37	.....	42 75	

8010	Penn Haven Junction to Tom- boken.	Lehigh Valley	24. 1	11 1/2	70 11
8017	Branch, Lumber Yard to Elber- vale.		6. 23	15	42 75
8018	Branch, Tunnel to Eckley.	Delaware, Lackawanna and West- ern.	2. 23	6	42 75
8019	Scranton to Northumberland		80	21 1/2	84 04 1/2
8020	Scranton to Carbondale	Delaware and Hudson Canal Com- pany.	17. 6	12	55 57 1/2
8021	Elizabethton, N. Y., to New Hamp- ton, N. J.	Delaware, Lackawanna and West- ern.	144. 5	12	94 05
8022	Elmira, N. Y., to Blossburgh, Pa.		45. 5	12	57 29 1/2
8023	Branch, Tioga Junction to Law- renceville.		3. 93	12	42 75
8024	Branch, Blossburgh to Arnot.	Tioga	4. 09	6	42 75
8025	Branch, Blossburgh to Morris- ton.		4. 09	6	42 75
8026	Williamsport to Elmira, N. Y.	Northern Central	79. 17	18	83 19 1/2
8027	Sunbury to Erie.	Pennsylvania	248. 08	13 1/2	77 84 1/2
8028	Sunbury to Mount Carmel		38. 82	13 1/2	181 46 1/2
8029	Buffalo to Carrollton, N. Y.	Northern Central	24. 36	12	42 75
8030	Buffalo to Corry	New York, Lake Erie and Western	24. 79	8 1/2	1, 126 89
8031	Strasburgh to Lehigh Place	Pittsburgh, Titusville and Buffalo	95	12 1/2	42 75
8032	Lehigh Place to Mauch Chunk	T. & H. Baumgartner	3. 25	6	5, 695 77
8033	Harrisburgh to Auburn	Pennsylvania	31. 5	16 1/2	42 75
8034	Harrisburgh to Homewood.	Philadelphia and Reading	58. 76	7 1/2	2, 073 80
8035	Harrisburgh to Martinsburgh, W. Va.	Pittsburgh, Fort Wayne and Chi- cago.	15. 2	12	42 75
8036	Columbia to Sinking Spring	Cumberland Valley	94. 07	18	1, 763 45
8037	Branch, Junction to Quarryville	Reading and Columbia	40. 17	14 1/2	76 09 1/2
8038	Columbia to Frederick, Md.	Pennsylvania	23. 31	13 1/2	47 88
8039	Branch, Junction to East Berlin		69. 9	13 1/2	42 75
8040	Huntingdon to Mount Dallas	Hanover Branch	18. 6	12	47 02 1/2
8041	Station		7. 21	6	62 15 1/2
8042	Branch, Saxton to Dudley	Huntingdon and Broad Top	45. 14	12	42 75
8043	Branch, Curwinstown		6	6	54 72
8044	Branch, Martinsburgh	Pennsylvania	47. 5	12	42 75
8045	Branch, Martinsburgh Junction		22. 52	21	58 99 1/2
8046	Branch, Martinsburgh Junction		3	6	44 46
8047	Branch, Martinsburgh Junction		6. 51	6	38 47 1/2
8048	Branch, Martinsburgh Junction		10. 9	12	38 47 1/2
8049	Branch, Martinsburgh Junction		55. 1	12	42 75
8050	Branch, Martinsburgh Junction		3. 5	18	53 01
8051	Branch, Martinsburgh Junction		64. 6	6	57 02 1/2
8052	Branch, Martinsburgh Junction		32. 49	12	65 83 1/2
8053	Branch, Martinsburgh Junction		132. 6	12	42 75
8054	Branch, Martinsburgh Junction		19	19	115 42 1/2
8055	Branch, Martinsburgh Junction		36. 63	9	15, 305 35
8056	Branch, Martinsburgh Junction		19	9	1, 056 92
8057	Branch, Martinsburgh Junction		19	12	55 57 1/2
8058	Branch, Martinsburgh Junction		19	12	54 72

B.—Railroad service as in operation on the 30th of June, 1879—Continued.

Number of route.	State and terminal.	Corporate title of company carrying the mail.	Distance.	Total distance in each State.	Number of trips per week.	Annual pay.	Annual pay in each State.	Annual cost per mile on each route.	Remarks.
	PENNSYLVANIA—Continued.								
8044	Erie to New Castle	Erie and Pittsburgh	98.5	Miles.	12	Dollars.	Dollars.	Dollars.	
8045	Old City to Ashland, Ohio	Lake Shore and Michigan Southern.	87.49		6	3,964.61		95.76	
8046	Bethlehem to Wind Gap	Lehigh and Lackawanna.	25.5		6	1,080.12		45.31	
8047	Dawson to New Holland.	Pennsylvania	28		12	1,197.00		42.75	Pay on 8.32 miles estimated.
8048	West Chester to intersection Pennsylvania Railroad.	West Chester.	9		6	346.27		38.47	
8049	Junction Pennsylvania Railroad to Millroy.	Pennsylvania	12.5		15	534.37		42.75	
8050	Pottsville to Frackville.	Philadelphia and Reading	11.64		9	497.61		42.75	
8051	Greenville to Hillard's.	Shenandoah and Allegheny	46.4		9	2,062.94		44.46	
8052	Carlisle to Pine Grove Furnace	South Mountain Iron Company	19.02		6	650.48		34.30	
8053	Freight to Butler.	Pennsylvania	22.06		12	1,056.25		47.88	
8054	Washington, Del., to Reading, Pa.	Washington and Northern	73		6	3,120.75		42.75	
8055	Pittsburgh to Washington.	Pittsburgh, Cincinnati and Saint Louis	22.71		12	1,561.22		66.06	
8056	Pottersville Junction to Enns.	Philadelphia and Reading	38.22		6	1,633.90		42.75	
8057	Pottersville to Colebrookdale.	do	13.97		6	1,577.22		42.75	
8058	Lebanon to Tower City	do	4.89		6	1,854.62		42.75	
8059	Swanton to Permits	State Line and Sullivan	23.32		6	974.19		38.47	
8060	Schenck Haven to Glen Carbon	Philadelphia and Reading	14.64		9	563.11		42.75	
8061	Opton to Knitztown.	do	4.34		21	206.91		42.75	
8062	Pittsburgh to Cumberland, Md.	do	136.1		18			82.83	
	Branch, Broad Ford to Mount Pleasant.		8.39		6			42.75	
8063	Branch, Connellsville to Uniontown.	Pittsburgh and Connellsville.	11.7		12	13,450.18		51.30	
8064	Carlisle to Snouquebanus.	New York, Lake Erie and Western.	38.25		6	1,635.19		42.75	
8065	Corning, N. Y., to Antirum, Pa.	do	82.4		14			51.90	
8066	Branch, Lawrenceville to Elk land.	Fall Brook Coal Company	12.98		12	3,265.21		44.46	
8067	Pennixville to Eagle	Philadelphia and Reading	12.06		6	515.56		42.75	
8068	Lewisburg to Spring Mills	Pennsylvania	42.38		6	1,918.74		42.75	
8069	Union City to Titusville	Pittsburgh, Titusville and Buffalo	14.1		6	602.77		42.75	
8070	Titusville to Titusville	Titusville (day trip) Pennsylvania	10		6	602.77		42.75	
8071	Titusville to Titusville	Titusville (night trip) Pennsylvania	10		6	421.61		42.75	
8072	Titusville to Titusville	Titusville (night trip) Pennsylvania	31.44		6	916.56		42.75	

{ \$107 per annum included for mail-messenger service.
Pay estimated.

8072	Mount Dallas Station to Hyndman.	Pennsylvania	31	100 80	12	1,000 81	83 86 4
8073	Allentown to Harrisburg	Philadelphia and Reading	90, 60	23 38	24	10, 815 75	110 77
8074	Conabocken to Flourtown	do	7 3	28 05	24	10, 815 75	42 75
8075	Easton to Allentown	Lohigh Valley	17 2	8 85	48 1/2	3, 160 20	131 93
\$550 per annum included for transfer of mail beyond terminus at Easton to Mechanics, and thence to New York.							
8076	Red Bank Furnace to Drifwood.	Allegheny Valley	100 80	12 97	9	5, 355 48	46 73 1/2
8077	Chambersburg to Waynesborough.	Mont Alto	23 38	30 43	6	8, 899 54	38 47 1/2
8078	Tunkamock to Montrose	Montrose	28 05	32 05	6	1, 199 14	42 75
8080	Mechanicsburg to Dillsburgh	Chamberland Valley	8 85	12 97	6	1, 378 34	42 75
8081	Pittsburg to Monongahela City.	Pittsburgh, Virginia and Charleston	31 04	20 43	12	1, 645 43	53 01
8082	Valley Junction to Ebbsvale, Md.	Bachman Valley	12 97	27 87	6	332 08	25 65
8083	Hollidayburg to Royer.	Pennsylvania	20 43	32 05	9	873 38	42 75
8085	Mount Union to Broad Top.	East Broad Top Railroad and Coal Company.	32 05	27	6	1, 233 12	38 47 1/2
8086	Fallock to Butler	Parker and Karns City	27	8 84	8 1/2	1, 338 93	49 50
8087	Bethlehem to Laydsville	Bell's Gap	8 84	3 58	6	802 33	34 20
8088	Phillipsburg to Morrisdale Mines.	Pennsylvania	3 58	43 73	6	153 47	42 75
8089	Reading to Slatington	Philadelphia and Reading	43 73	8 53	6	1, 082 51	38 47 1/2
8090	Berlin to Garrett	Buffalo Valley	8 53	22 15	12	304 06	42 75
8091	Larabee to Clermont	McKean and Buffalo	22 15	36 25	6	946 91	42 75
8092	York to Delta	Peach Bottom	36 25	10 41	6	1, 549 69	42 75
8093	Lawsonham to Sligo	Allegheny Valley	10 41	21 93	6	356 02	34 20
8094	Oxford to Peter's Creek	Peach Bottom	21 93	7	6	843 75	38 47 1/2
8095	Pittsburg to Castle Shannon.	Pittsburgh and Castle Shannon	7	36 49	6	299 25	42 75
8096	New Castle to Stony Brook.	New Castle and Franklin	36 49	9 85	6	1, 559 95	42 75
8097	White Haven to Upper Lehigh	Central Railroad Company of New Jersey.	9 85	10 3	6	336 87	34 20
8098	Norristown to Lansdale	Stony Creek	10 3	9 2	12	396 29	38 47 1/2
8099	Osceola Mills to Ramey	Pennsylvania	9 2	13 7	6	353 97	38 47 1/2
8100	Tamaqua to Mauch Chunk	Central Railroad Company of New Jersey.	13 7	11 55	6	527 11	38 47 1/2
8101	Wilkesbarre to Wanamie	do	11 55	13 37	6	444 88	38 47 1/2
8102	Hanover Junction to Hanover	Hanover Branch	13 37	49 1	12	881 41	65 93
8103	Jenkintown to Roundbrook, N. J.	Delaware and Roundbrook	49 1	41 9	6	2, 099 02	42 75
8104	Southwest Junction to Oliphant Furnace.	Pennsylvania	41 9	30 12	6	2, 436 06	58 14
8105	Emulston to Clarion	Emulston and Shippensville	30 12	21 09	12	1, 699 67	56 43
8106	Millsburgh to Williamstown	Summit Branch	21 09	45	12	901 60	42 75
8108	Lewistown Junction to Selin's Grove Junction.	Pennsylvania	45	11 3	6	1, 923 75	42 75
8109	Arlington to Broadville	Northeast Pennsylvania	11 3	5 74	6	483 07	42 75
8110	Catawissa Junction to Hughesville.	Muncy Creek	5 74	6 5	6	245 48	42 75
8111	Blossburg to Fall Brook	Fall Brook Coal Company	6 5	8 6	6	277 87	42 75
8112	Foxburgh to Turkey City	Foxburgh, Saint Petersburg and Clarion	8 6	28 72	6	387 05	42 75
8114	Washington to Waynesburgh	Waynesburgh and Washington	28 72		6	1, 227 78	42 75

B.—Railroad service as in operation on the 30th of June, 1879 Continued.

Number of route.	State and termini.	Corporate title of company carrying the mail.	Distance.	Total distance in each State.	Number of trips per week.	Annual pay.	Annual pay in each State.	Annual cost per mile on each route.	Remarks.
	PENNSYLVANIA—Continued.		Miles.	Miles.		Dollars.	Dollars.	Dollars.	
8115	Pittsburgh to Washington.	Pittsburgh Southern.	38.26		6	1,685 61		42 75	Pay on 19 miles estimated.
8116	Honesdale to Carbondale.	Delaware and Hudson Canal Company.	17.3		6	739 57		42 75	
8117	Newtown Junction to Newtown.	Philadelphia, Newtown and New York.	27.1		6	1,158 52		42 75	
8118	Lattrobe to Ligonier.	Ligonier Valley.	11.04		6	471 96		42 75	
8119	Shenandoah to Mahanoy Place.	Philadelphia and Reading.	7.02		6	300 10		42 75	
8120	Salisbury Junction to Elk Lick.	Salisbury.	7.43		6	317 63		42 75	
8121	Bradford to Olean.	Olean, Bradford and Warren.	22.83		6	975 96		42 75	
8122	Allegheny Bridge to Bradford.	Kendall and Eldred.	21.94		6	837 93		43 75	Pay estimated.
8123	Pittsburgh to Youngstown, Ohio.	Pittsburgh and Lake Erie.	68.03		6	2,908 28		42 75	Do.
8124	Columbia to Port Deposit, Md.	Columbia and Port Deposit.	39.65	5,061.63	6	1,695 03	613,519 61	42 75	Do.
	DELAWARE.								
9501	Wilmington to Delmar.	Philadelphia, Wilmington and Baltimore.	97.02		12	10,451 96		107 73	
9502	Delmar to Crisfield, Md.	Eastern Shore.	38		6	2,599 20		68 40	
9503	Clayton to Easton, Md.	Maryland and Delaware.	44		6	2,332 44		53 01	
9504	Harrington to Lewes.	Junction and Breakwater.	1,710 00		12	1,710 00		43 75	
9505	Wilmington to Pomeroy, Pa.	Delaware Western.	38.85		6	1,494 75		38 47½	Pay on 19.32 miles estimated.
9506	Georgetown to Selbyville.	Breakwater and Frankford.	19.3	277.17	6	825 07	19,413 42	42 75	
	MARYLAND.								
10001	Baltimore to Philadelphia, Pa., per week.	Philadelphia, Wilmington and Baltimore.	96		36½	46,301 30		490 47½	
10002	Baltimore to Sunbury, Pa.	Northern Central.	140.7		24	27,336 60		42 75	
10003	Baltimore to Wheeling, W. Va.	Baltimore and Ohio.	99.92		23	124,862 46		104 29	
10004	Araby to Frederick.	do.	8.75		38	186 68		337 09½	
10005	Wrentham to Hagerstown.	Western Maryland.	24.93		12	1,405 84		297 09½	
10006	Baltimore to Williamsport.	Baltimore and Annapolis.	21.5		11	1,369 77		52 75	
10007	Annapolis to Annapolis Junction.	Annapolis and Annapolis Junction.	21.5		11	1,369 77		52 75	

10008	Cumbridge to Sanford, Del.	33.63	6	1,437 68	42 75
10009	Sallabury to Ocean City	31.02	6	1,326 10	42 75
10010	Townsend, Del., to Centreville, Md.	36.34	6	1,553 53	42 75
10011	Cumberland to Piedmont, W. Va.	33.76	6	1,443 24	42 75
10012	Clayton, Del., to Chestertown, Md.	30.08	6	1,401 06	40 59
10013	Day View to Washington, D. C.	46.1	41½	17,685 95	363 86
10014	Bowie to Pope's Creek	48.88	6	2,256 78	46 17
10015	Newtown Junction to Newtown	9.7	6	414 67	42 75
10016	Sallyville, Del., to Franklin City, Va.	35.90	6	1,537 29	42 75
10017	Baltimore to Harper's Ferry, W. Va.	60	14½	4,858 12	64 12½
10018	Lake Roland to Western Maryland Railroad Junction	21	14½	290 70	48 12½
10019	Emmitsburg to Rocky Ridge	8.5	6	290 70	34 20
		7	12	299 25	42 75
		1,176.5		241,677 47	
VIRGINIA.					
11001	Washington, D. C., to Richmond, Va.	131.2	13	42,802 08	326 24
11002	Alexandria to Lynchburg	171.35	14 }	37,590 56	216 72½
11003	Branch, Owl Run to Warrenton.	9.17	12 }	2,874 01	49 59
11004	Alexandria to Strasburg	62.55	6	2,885 83	42 75
11005	Richmond to Round Hill	52.74	12	33,496 04	54 72
11006	Richmond to Huntington, W. Va.	421.14	12	30,487 55	79 51½
11007	Richmond to Greensborough, N. C.	189.67	10½	1,800 63	180 74
	Richmond to West Point	40.5	12	5,792 80	44 46
11008	Richmond to Petersburg	24.07	20	13,780 41	240 66½
11009	Petersburg to Weldon, N. C.	65.31	13	5,357 87	211 00
11010	Petersburg to City Point	10	6	5,357 87	42 75
11011	Petersburg to Norfolk	81.5	6	6,535 46	64 08
11012	Petersburg to Lynchburg	122.26	6	34,571 20	53 01
11013	Lynchburg to Bristol, Tenn.	205	14	34,571 20	108 64
11014	Glade Spring to Saltville	8.5	6½	3,797 88	164 20
11015	Portsmouth to Weldon, N. C.	78.31	12	6,626 35	47 88
11016	Lynchburg to Danville	65.97	12	320 62	100 44½
11017	Chester to Winterpock	18.75	6	1,401 92	17 10
11018	Washington, D. C., to Alexandria, Va.	7	18½	299 25	200 27½
11019	Sutherland to Milton, N. C.	7	6	1,635 19	42 75
11020	Fredericksburg to Orange C. H.	38.25	6	232,585 15	42 75
		1,813.23			
WEST VIRGINIA.					
12001	Harper's Ferry to Staunton, Va.	101.6	7½	7,715 81	63 27
12002	Grafton to Parkersburg	104.58	7½	24,659 44	48 73½
			20		235 79½

[illegible]

Pay on 18.11 miles estimated.

Pay estimated.

B.—Railroad service as in operation on the 30th of June, 1879—Continued.

Number of route.	State and termini.	Corporate title of company carrying the mail.	Distance. Miles.	Total distance in each State. Miles.	Number of trips per week.	Annual pay. Dollars.	Annual pay in each State. Dollars.	Annual cost per mile on each route. Dollars.	Remarks.
GEORGIA—Continued.									
15022	Griffin to Carrollton	Savannah, Griffin and North Alabama.	59.86	6	\$2,303 11	\$38 47½	Pay estimated.
15023	Brunswick to Albany	Brunswick and Albany	173.31	.....	3	4,445 40	.....	25 65
15024	Columbus to Hamilton	North and South	23.51	.....	6	703 54	.....	29 97½
15025	Athens to Bellton	Northeastern Railroad Company of Georgia.	40.53	.....	6	1,732 66	.....	42 75
15026	Toccoa to Elberton	Elberton Air Line	51	.....	6	2,180 25	.....	42 75
				2,460 605		\$199,902 44			
FLORIDA.									
16001	Fernandina to Cedar Keys	Atlantic, Gulf and West India Transit Company.	154.8	6	5,294 16	34 20	Pay estimated.
16002	Lake City to Chattahoochee	Jacksonville, Pensacola and Mobile.	152.73	.....	11½	8,731 70	.....	54 72
	Branch, Tallahassee to Saint Marks.		21.89	.....	3			17 10
16003	Pensacola to Whiting Junction	Pensacola and Louisville	44.05	.....	13	1,807 81	.....	41 04
16004	Turnel to Saint Augustine	Saint John's	15.09	.....	6	670 75	.....	42 75
16005	Pensacola to Millview	Pensacola and Perdido	8	.....	6	265 20	.....	25 65
16006	Jacksonville to Lake City	Florida Central	60.3	.....	13	3,299 62	.....	54 72
				457.46		20,009 24			
ALABAMA.									
17001	Montgomery to West Point, Ga.	Western Railroad Company of Alabama.	88.2	14	11,577 13	130 81½	Pay on branch estimated.
17002	Montgomery to Selma	do	50	.....	7	2,137 50	.....	42 75
17003	Montgomery to Eufula	Montgomery and Eufula	81.24	.....	78	3,542 46	.....	43 60½
17004	Branch, Elmore to Wetumpka	South and North Alabama	183.66	.....	14	15,742 79	.....	84 13½
	Memphis, Tenn., to St. Stephens, Ala.		6.81	.....	6			94 05
17005	Branch, Moscow to Sonserville	do	271.5	.....	14	26,423 22	.....	42 75
	Branch, Tusculum to Florence		14.5	.....	7			42 75
	Branch, Junction to Greensborough, Ga.		36.03	.....	6	1,540 28	.....	42 75
17007	Montgomery to Wetumpka	Western Railroad Company of Alabama.	28	.....	14	1,675 80	.....	59 65
	Branch, to Greenville, Ala.		90	.....	6	3,447 36	.....	38 30½
17009	Branch, to Greenville, Ala.	do	114.13	.....	7	6,337 63	.....	57 29½

Year	Line	Pay estimated.	Pay on 8.77 miles estimated.	\$40 per annum included for mail-messenger service.	\$1,912.50 per annum included for single daily line of rail-way post-office cars.
17010	Seima, Rome, and Dalton	156	18,228 98	51 20	
17012	Mobile to Montgomery	81.5		64 124	
17013	Mobile to New Orleans, La	113.29	23,673 15	140 854	
17014	Orlando to Buffalo	141.88	21,057 12	123 004	
17015	Chattanooga, Tenn., to Merid- ian, Miss.	22.5	709 50	148 416	
17016	Albany and Chattanooga	24.5	10,298 47	34 20	
17017	Savannah and Memphis	270.5	2,295 04	38 474	
17018	Seima and Gulf	59.65	1,661 74	38 474	
17019	Turkey	43.19	256 50	42 75	
17020	East Alabama and Cincinnati	6	745 90	34 20	
17021	Vicksburg and Brunswick	21.81	525 82	25 65	
17022	Seima and New Orleans	30.5	255 21	42 75	
17023	Birmingham to Pratt Mines	5.97	147,657 52		
		2,009.14			
18001	New Orleans, Saint Louis and Chi- cago	344.11	42,072 60	122 264	
18002	Mississippi and Tennessee	101.31	6,323 27	62 414	
18003	Vicksburg and Meridian	45.83	7,656 05	76 65	
18004	Mobile and Ohio	472.73	23,812 00	43 778	
18006	Grand Gulf and Port Gibson	14.03		54 72	
18007	Mobile and Ohio	11.51	542 00	42 75	
18008	Ripley	8	323 87	34 20	
18009	New Orleans, Saint Louis and Chi- cago, operating Mississippi Cen- tral	25.15	860 13	34 20	
18010	Natchez, Jackson and Columbus	21.57	737 69	34 20	
		43.09	1,842 09	42 75	
		1,191.51	87,169 70		
19001	Tennessee and Pacific	32.75	1,400 06	42 75	
19002	East Tennessee, Virginia and Georgia	242.7	42,144 99	163 51	
19003	Rogersville and Jefferson	28.5	681 25	86 834	
19004	Nashville and Chattanooga	114	28,013 10	42 75	
19005	Nashville, Chattanooga and Saint Louis	39	1,710 00	155 284	
19006	Louisville and Nashville	40	12,437 97	155 284	
		47		42 75	
		75.338		111 15	
				96 76	

B.—Railroad service as in operation on the 30th of June, 1879—Continued.

Number of route.	State and termini.	Corporate title of company carrying the mail.	Distance. Miles.	Total distance in each State. Miles.	Number of trips per week.	Annual pay. Dollars.	Annual pay in each State. Dollars.	Annual cost per mile on each route. Dollars.	Remarks.
GEORGIA—Continued.									
15022	Griffin to Carrollton	Savannah, Griffin and North Alabama.	59.86	.....	6	\$2,303 11	.....	\$38 47½	
15023	Brunswick to Albany	Brunswick and Albany	173 31	.....	3	4,445 40	.....	25 65	
15024	Columbus to Hamilton	North and South	23 51	.....	6	703 54	.....	29 92½	
15025	Athens to Ballton	Northeastern Railroad Company of Georgia	40 53	.....	6	1,732 66	.....	42 75	
15026	Toccoa to Elberton	Elberton Air Line	51	.....	6	2,180 25	.....	42 75	Pay estimated.
	FLORIDA.			2,460.005		\$190,902 44			
16001	Fernandina to Cedar Keys	Atlantic, Gulf and West India Transit Company.	154.8	.....	6	5,394 16	.....	34 20	
16002	Lake City to Chattahoochee	Jacksonville, Pensacola and Mobile.	152.73	.....	11½	8,731 70	.....	54 72	
16003	Branch, Tallahassee to Saint Marks		21.99	.....	3		.....	17 10	
16003	Pensacola to Whiting Junction	Pensacola and Louisville	44.05	.....	13	1,807 81	.....	41 04	
16004	Trail to Saint Augustine	Saint John's	15.60	.....	6	670 75	.....	42 75	
16005	Pensacola to Milview	Pensacola and Perdido	8	.....	6	265 20	.....	25 65	
16006	Jacksonville to Lake City	Florida Central	60.3	457.46	13	3,290 62	20,009 24	54 72	
ALABAMA.									
17001	Montgomery to West Point, Ga.	Western Railroad Company of Alabama.	88.2	.....	14	11,577 13	.....	130 81½	
17002	Montgomery to Selma	do	50	.....	7	2,137 50	.....	42 75	
17003	Montgomery to Euftalia	Montgomery and Eufaula.	81.24	.....	78	3,542 46	.....	43 60½	
17004	Branch, Elmore to Wetumpka	South and North Alabama.	183.66	.....	14	15,742 79	.....	84 13½	
17005	Branch, Tusculum to Stevenson, Ala.		6.81	.....	3		.....	42 75	
17005	Branch, Moscow to Stevenson, Ala.		271.5	.....	14	26,432 32	.....	94 05	
17006	Branch, Tusculum to Phenix	Memphis and Charleston	14.5	.....	7		.....	42 75	
17006	Branch, Tusculum to Phenix		6.5	.....	7		.....	42 75	
17007	Branch, Tusculum to Phenix	Selma, Marion and Memphis	36.03	.....	6	1,540 26	.....	42 75	
17007	Branch, Tusculum to Phenix	Western Railroad Company of Alabama.	28	.....	14	1,675 80	.....	59 86	
17008	Branch, Tusculum to Phenix	Alabama	90	.....	6	3,447 36	.....	38 30½	
17008	Branch, Tusculum to Phenix	Alabama	114.13	.....	7	6,537 60	.....	57 2½	Pay on branch estimated.

Year	Line	Pay estimated.	Pay on 8.77 miles estimated.	\$200 per annum included for mail-messenger service.	\$40 per annum included for mail-messenger service.	\$1,912.50 per annum included for single daily line of rail-way post-office cars.
17010	Selma, Rome, and Dalton	159	18,228 98	51 30		
17012	Mobile to Montgomery	81 5		64 12 1/2		
17013	Mobile to New Orleans, La	64 88	23,673 15	149 85 1/2		
17014	Orleans to Buffalo	118 29	21,087 13	123 00 1/2		
17015	Chattanooga, Tenn., to Merid- ian, Miss.	141 88	700 50	148 41 1/2		
17016	Orleans to Good Water	22 5	10,298 47	42 75		
17017	Savannah and Memphis	270 5	2,295 04	34 20		
17018	Chattanooga and Gulf	68 65	1,661 74	38 47 1/2		
17019	Tuskegee	43 19	256 50	42 75		
17020	East Alabama and Cincinnati	6	745 90	34 20		
17021	Vicksburg and Brunswick	21 81	525 82	25 65		
17022	Selma and New Orleans	20 5	255 21	42 75		
17023	Birmingham to Pratt Mines	5 97	147,657 52			
		2,002 14				
			42,072 60	122 26 1/2		
18001	New Orleans, Saint Louis and Chi- cago	344 11	6,323 27	62 41 1/2		
18002	Mississippi and Tennessee	101 31	7,656 06	76 95		
18003	Vicksburg and Meridian	45 83		54 72		
18004	Mobile, Ala., to Columbus, Ky. Branch, Artesia to Columbus, Miss.	95 21	26,812 00	42 75		
18005	Branch, Artesia to Starkville	472 73		29 92 1/2		
18006	Grand Gulf to Port Gibson	14 03	542 00	42 75		
18007	Mobile and Ohio	11 51	323 87	34 20		
18008	Muldon to Aberdeen	8	890 13	34 20		
18009	Middleton Station, Tenn., to Rip- ley, Miss.	9 47	737 69	34 20		
18010	Durant to Kosciusko	25 15				
	New Orleans, Saint Louis and Chi- cago, operating Mississippi Cen- tral	21 37				
	Natchez, Jackson and Columbus	43 09	1,842 09	42 75		
		1,191 51	87,169 70			
19001	Tennessee and Pacific	32 75	1,400 06	42 75		
19002	East Tennessee, Virginia and Georgia	242 7	42,144 99	163 51		
19003	Rogersville and Jefferson	28 5	681 25	88 85 1/2		
		15		42 75		
19004	Nashville and Chattanooga	114	26,013 10	155 29 1/2		
19005	Nashville, Chattanooga and Saint Louis	39	1,710 00	155 29 1/2		
19006	Louisville and Nashville	40	12,437 97	42 75		
		47		111 15		
		75 839		96 70		

B.—Railroad service as in operation on the 30th of June, 1879—Continued.

Number of route.	State and terminal.	Corporate title of company carrying the mail.	Distance.	Total distance in each State.	Number of trips per week.	Annual pay.	Annual pay in each State.	Annual cost per mile on each route.	Remarks.
			<i>Miles.</i>	<i>Miles.</i>		<i>Dollars.</i>	<i>Dollars.</i>	<i>Dollars.</i>	
TENNESSEE—Continued.									
19007	Nashville to Hickman, Ky.	Nashville and Chattanooga	155	155	13	12,560 40		73 53	
19010	Memphis to Paris.	Nashville and Nashville	115 2	115 2	7			{ 138 25	On 80 miles.
19011	Knoxville to Garyville.	Louisville and Nashville	17 3	17 3	20	20,120 56		{ 200 14	On 43.5 miles.
19012	Morristown to Wolf Creek	Knoxville and Ohio	38 84	38 84	13	1,498 22		38 47	
19013	Tracy City to Cowan	East Tennessee, Virginia and Georgia.	38 8	38 8	6	1,361 16		34 20	
19014	Memphis to Covington	Tennessee Coal and Railroad Company.	23	23	6	786 00		34 20	
19015	Victoria to Bridgeport, Ala.	Paducah and Memphis	38 31	38 31	6	1,310 20		34 20	
19016	Tulahoma to McMinnville	Nashville and Chattanooga	19 875	19 875	6	849 65		42 75	
19017	Knoxville to Maryville	Nashville, Chattanooga and Saint Louis.	35	35	6	1,496 25		42 75	
19018	Columbia to Lewisburgh	Knoxville and Charleston	16 27	16 27	6	625 99		38 47	
		Duck River Valley	26 23	26 23	6	778 34		38 47	
			1,177 028	1,177 028			123,774 74		
KENTUCKY.									
20001	Ashland to Geigersville.	Lexington and Big Sandy	13 98	13 98	6	358 59		25 65	
20002	Covington to Lexington	Kentucky Central	97	97	12	10,513 80		104 20	
20003	La Grange to Lexington	Louisville, Cincinnati and Lexington.	69	69	12	4,983 79		74 38	
20004	Cincinnati, Ohio, to Louisville, Ky.	do	108 45	108 45	18	28,089 34		256 95	
20005	Louisville to Nashville, Tenn.	Louisville and Nashville.	1 3	1 3	18			104 65	
20006	Hardstown Junction to Hardstown.	do	112 44	112 44	18	47,329 48		266 91	
20007	Branch, Richmond Junction to Richmond.	do	73 1	73 1	18	665 63		236 91	
20008	Bowling Green to Paris	do	17 3	17 3	7	8,061 55		38 47	
20009	Paducah to Tumbler	do	76 4	76 4	6			65 83	
20010	Elizabethtown to Paducah	do	83 5	83 5	6	26,950 08		38 47	
20011	Elizabethtown to Glasgow	do	83 8	83 8	6			52 16	
20012	Elizabethtown to Glasgow	do	134 08	134 08	13	3,276 36		201 00	
20013	Elizabethtown to Glasgow	do	50 64	50 64	13			42 75	
20014	Elizabethtown to Glasgow	do	166 19	166 19	6	11,519 44		64 12	
20015	Elizabethtown to Glasgow	do	16 19	16 19	104	812 23		42 75	

Pay on 11.66 miles estimated.

Year	Line	Miles	Pay	Pay on 11.66 miles estimated
20014	Willard to Group.	24.5	1,327 39	38 47½
20015	Owensborough to Owensborough Junction.	36.13	1,544 56	42 7½
20016	Mayesville and Lexington	50	2,970 00	59 40
20017	Lexington to Mount Sterling	32.84	1,562 40	46 17
20018	Cincinnati Junction to Louisville and Nashville Junction.	4.13	890 47	216 61
20019	Louisville and Nashville.	45.73	1,797 55	38 47½
20020	Covington, Flemingsburgh and Pound Gap.	17.08	780 17	42 7½
20021	Cincinnati Ohio, to Somerset, Ky.	160.26	9,591 56	59 85
20022	Harrodsburgh to Harrodsburgh Junction.	6.43	274 88	42 7½
20023	Mount Sterling to Cornwell.	19.68	757 19	38 47½
	Coal Road Construction Company.	1,472.96	164,959 47	
OHIO.				
21001	Bellare to Columbus	104.875	24,973 00	211 82½
21002	Pittsburgh, Pa., to Chicago, Ill.	33	131,580 41	74 38½
21003	Pittsburgh, Pa., to Bellare, Ohio	468.85		280 64½
21004	Hudson to Columbus	94.5	10,503 68	111 15
21005	Cleveland to Sharpville, Pa.	61	11,225 46	76 95
21006	Cleveland to Wellsville	40	6,638 91	78 66
21007	Elyria to Millbury	44.88	13,565 26	132 52½
21008	Bayard to New Philadelphia	54.5	43,693 09	582 77
21009	Minerva to Dell Roy	74.96	1,697 25	51 30
	Youngstown and Connoton Valley, operating Ohio and Toledo.	22.22	949 91	42 7½
21010	Sandusky to Newark	88	21,026 98	221 28
21011	Xenia to Dayton	28	990 24	57 57½
21012	Springfield to Sandusky	17	8,964 34	54 72
21013	Columbus to Delaware	131.35	2,116 13	68 40
21014	Columbus to Cincinnati	24.75	42,530 08	85 50
21015	Columbus to Indianapolis, Ind.	120.48	75,541 22	353 08
	Central.	188		401 81½
21016	Gallon to Indianapolis, Ind.	119.4	36,495 60	178 90
21017	Blanchester to Hillsborough	84.6	915 71	43 80½
21018	Portsmouth to Hamden Junction.	21	4,404 96	78 66
	Toledo, Ohio, to Quincy, Ill.	56		282 37½
21019	Branch, Bluffs to Naples	476	113,175 50	76 95
	Branch, Clayton to Keokuk	4		51 30

B.—Railroad service as in operation on the 30th of June, 1879—Continued.

Number of route.	State and termini.	Corporate title of company carrying the mail.	Distance.	Total distance in each State.	Number of trips per week.	Annual pay.	Annual pay in each State.	Annual cost per mile on each route.	Remarks.
			Miles.	Miles.		Dollars.	Dollars.	Dollars.	
21020	Frankfort to Minster.....	Lake Erie and Louisville.....	80 35	80 35	6	4,965 88		45 31½	Pay on 21.45 miles estimated.
21021	Carey to Findlay.....	Cincinnati, Sandusky and Cleveland.....	21 45	21 45	6	615 60		49 75	
21022	Dayton to Union City, Ind.....	Dayton and Union.....	48 17	48 17	12	2,985 20		38 47½	
21023	Dayton to Toledo.....	Dayton and Michigan.....	142 06	142 06	16½	16,645 53		47 02½	
21024	Hamilton to Indianapolis, Ind.....	Cincinnati, Hamilton and Dayton.....	99 40	99 40	15½	15,444 00		109 44	
21025	Hamilton to Richmond, Ind.....	Cincinnati, Richmond and Chicago.....	45 1	45 1	12	3,470 45		54 72	
21026	Cincinnati to Dayton.....	Cincinnati, Hamilton and Dayton.....	33 53	33 53	59½	8,433 21		70 86	
21027	Xenia to Springfield.....	Pittsburgh, Cincinnati, and Saint Louis.....	33 92	33 92	27	812 25		153 90	
21028	Cincinnati to Parkersburgh, W. Va.....	Marietta and Cincinnati.....	195 15	195 15	15½	47,517 07		128 25	
21029	Morrow to Dresden.....	Pittsburgh, Cincinnati, and Saint Louis.....	149 4	149 4	6½	8,047 44		42 75	
21030	Dayton to Richmond, Ind.....	do.....	42 58	42 58	12	2,046 87		48 73½	
21031	North Bend to Hagerstown, Ind.....	Indianapolis, Cincinnati, and La Fayette, Ind.....	72 58	72 58	6	4,281 86		58 99½	
21032	Columbus to Pittsburgh, Pa.....	Pittsburgh, Cincinnati, and Saint Louis.....	183	183	20	123,264 67		636 90½	
21033	Branch, Meigs to Cadiz, Springfield to Columbus.....	Cincinnati, Sandusky, and Cleveland.....	45 86	45 86	12	2,666 80		42 75	
21034	Salamanca, N. Y., to Dayton, Ohio.....	Atlantic and Great Western.....	389 55	389 55	16	31,308 14		58 14	
21035	Youngstown to Cross Cut.....	Pittsburgh, Fort Wayne and Chicago.....	22 8	22 8	6	874 70		80 37	
21036	Columbus to Athens.....	Columbus and Hocking Valley.....	77 4	77 4	15	5,067 10		42 75	
21037	Branch, Logan to New Straitsville.....	Atlantic and Great Western.....	13 02	13 02	15	1,537 90		58 90½	
21038	Kellen to New Lisbon.....	Newark, Somerset and Stradville.....	33 94	33 94	6	1,006 34		38 47½	
21039	Newark to Shawson.....	Cleveland, Mount Vernon, and Delaware.....	44 04½	44 04½	12	468 54		45 31½	
21040	Marietta to Canal Dover.....	Marietta and Pittsburgh.....	13 7	13 7	6	4,615 15		34 20	
21041	Lorain to Uhrichsville.....	Cleveland, Tuscarawas Valley and Ohio Valley.....	96 96	96 96	6½	6,580 62		46 17	
21042	Cleveland to Uhrichsville.....	do.....	102 45	102 45	19	58,000 83		64 12½	
			80 25	80 25	10			250 40½	100 131.25 per annum included for rail way post-office cars.
			167 25	167 25	10			205 40½	

21043	Manassah to Toledo.....	Pennsylvania Company.....	48.1	.....	.....	5,404 77	.....	62 414	
21044	Harbor to Youngstown.....	do.....	62.1	.....	.....	7 7	.....	42 75	
21045	Toledo to Elkhart, Ind.....	Lake Shore and Michigan Southern	133.6	.....	.....	21,654 78	.....	536 134	
21046	Painesville to Youngstown.....	Painesville and Youngstown	60.12	.....	.....	2,672 94	.....	44 46	
21047	Chicago, Ohio, to Chicago, Ill.....	Baltimore and Ohio, operating Baltimore, Pittsburgh and Chicago.	271.1	.....	.....	66,010 14	.....	243 49	
21048	Dyon's to Cumberland.....	Eastern Ohio.....	7.8	.....	.....	333 45	.....	42 75	
21049	Madison to Parkersburg, W. Va.....	Marquette and Cincinnati	15.87	.....	.....	61 58	.....	61 58	
21050	Chillicothe to Stout's Landing.....	do.....	27	.....	.....	1,423 58	.....	38 474	
21051	Columbus to Pittsboro.....	Scioto Valley.....	102.1	.....	.....	7,082 00	.....	73 24	
21052	{ Little Miami Junction to Scott. } Branch, New Richmond to To- basco.	Cincinnati and Eastern.....	48.19	.....	.....	2,400 05	.....	46 7	Pay estimated.
21053	Columbus to Toledo.....	Columbus and Toledo.....	125.23	.....	.....	5,888 94	.....	47 024	
21054	Dayton to Muskegon.....	Dayton and Southeastern.....	70.09	.....	.....	3,475 78	.....	48 39	
21055	New Lexington to Moravia.....	Ohio Central.....	7.6	.....	.....	324 90	.....	42 75	
21056	St Clairsville to Quincy.....	Bellevue and Saint Clairsville, narrow gauge.	7.05	.....	.....	301 39	.....	42 75	
21057	Allentown Junction to Waynesville.....	Columbus, Washington and Cincinnati.....	26.97	.....	.....	1,152 96	.....	42 75	
21058	Jackson to Springfield.....	Springfield, Jackson and Pomeroy.	108.92	.....	.....	4,656 33	.....	42 75	Pay estimated.
21059	Junction Cincinnati, Hamilton and Dayton Railroad to Mount Healthy.....	College Hill.....	7.08	.....	.....	302 67	.....	42 75	
21060	Columbia (Junction Pittsburgh, Cincinnati and Saint Louis Railroad) to Amelia.....	Cincinnati and Portsmouth.....	20.4	.....	.....	872 10	.....	42 75	
21061	Wolcott to Shreve's Crossing.....	Toledo, Delphos and Indianapolis.....	57.19	.....	.....	2,444 87	.....	42 75	Pay estimated.
21062	Andover to Youngstown.....	Lake Shore and Michigan Southern	38.87	.....	.....	1,661 69	.....	42 75	Do.
			6,157.1	.....	.....	1,073,082 53	.....	
INDIANA.									
22001	Indianapolis to Vincennes.....	Indianapolis and Vincennes.....	116.32	.....	.....	6,265 58	.....	52 864	
22002	Indianapolis to Terre Haute.....	Terre Haute and Indianapolis.....	73	.....	.....	23,956 04	.....	410 364	
22003	{ Indianapolis to Cincinnati, Ohio } Branch, Lawrenceburgh to New- town Junction.	Indianapolis, Cincinnati and La Fayette.	111.5	.....	.....	32,147 66	.....	287 30	
22004	Indianapolis to Peru.....	Indianapolis, Peru and Chicago.....	2.66	.....	.....	6,068 58	.....	42 75	
22005	Indianapolis to La Fayette.....	Indianapolis, Cincinnati and La Fayette.	78	.....	.....	19,583 48	.....	298 414	\$600 per annum included for side service.
22006	Columbus to Madison.....	Jeffersonville, Madison and Indianapolis.	65.625	.....	.....	2,399 13	.....	52 154	
22007	New Albany to Indianapolis.....	do.....	46	.....	.....	15,468 09	.....	125 684	\$1,140 per annum included for second daily line with route-agent's apartment.
22008	New Albany to Michigan City.....	Louisville, New Albany and Chicago.	114	.....	.....	18,468 00	.....	64 124	
22009	Richmond to Chicago, Ill.....	Pittsburgh, Cincinnati and Saint Louis.	224.41	.....	.....	15,733 39	.....	70 11	

B.—Railroad service as in operation on the 30th of June, 1879—Continued.

Number of route.	State and terminal.	Corporate title of company carrying the mail.	Distance.	Total distance in each State.	Number of trips per week.	Annual pay.	Annual pay in each State.	Annual cost per mile on each route.	Remarks.
			Miles.	Miles.		Dollars.	Dollars.	Dollars.	
22010	INDIANA—Continued. Cincinnati, Ohio, to East Saint Louis, Ill.	Ohio and Mississippi.....	341		124	67,857 89		199 29	
22011	Cambridge City to Columbus.....	Jeffersonville, Madison and Indianapolis.	68		6	2,907 00		42 75	
22012	Evansville to Terre Haute.....	Evansville and Crawfordville.....	110		12	9,989 20		90 63	
22013	Terre Haute to Rockville.....	Logansport, Crawfordville and Southwestern.	23		6	983 25		42 75	
22014	State Line to Logansport.....	Pittsburgh, Cincinnati and Saint Louis.	61		6	3,911 62		64 124	
22015	Peru to La Porte.....	Chicago, Cincinnati and Louisville.	73		12	3,807 31		52 154	
22016	Fairland to Martinsville.....	Fairland, Franklin and Martinsville.	38.5		6	1,645 87		42 75	
22017	Bradford, Ohio, to Logansport, Ind.	Pittsburgh, Cincinnati and Saint Louis.	114.6		12	5,781 00		50 444	
22018	Indianapolis to Peoria, Ill.....	Indianapolis, Bloomington and Western.	212.2		18	19,413 12		91 484	
22019	Jeffersonville to North Vernon.....	Ohio and Mississippi.....	53.5		13	5,946 82		111 15	
22020	Fort Wayne to Connersville.....	Fort Wayne, Muncie and Cincinnati.	109		6	5,488 50		50 444	
22021	Richmond to Fort Wayne.....	Grand Rapids and Indiana.....	91.5		12	5,163 24		58 43	
22022	Anderson to Gothen.....	Cincinnati, Wabash and Michigan.	114.32		6	6,833 33		55 574	
22023	Princeton to Albion, Ill.....	Louisville, New Albany and Saint Louis.	81.03		6	928 58		29 924	
22024	Terre Haute to Danville, Ill.....	Evansville, Terre Haute and Chicago.	56.6		13	2,903 56		51 30	
22025	Indianapolis to Terre Haute.....	Indianapolis and Saint Louis.....	72		12	7,879 68		109 44	
22026	La Porte to Michigan City.....	Indianapolis, Peru and Chicago.	12.36		12	528 39		43 75	
22027	Bader to Logansport.....	Detroit, Red River and Illinois.....	94.5		6	4,847 85		51 30	
22028	Rockville to Logansport.....	Logansport, Crawfordville and Southwestern.	92.1		6	4,173 51		46 314	
22029	La Fayette to Kankakee, Ill.....	Cincinnati, La Fayette and Chicago.	76.75		13	21,115 21		278 75	
22030	Terre Haute to Maize.....	Cincinnati and Terre Haute.....	20.15		6	182 54		30 24	
22031	Attica to Vicksburg.....	Indiana North and South.....	14		6	478 56		34 26	
22032	Evansville to Boonville.....	Lake Erie, Evansville and Southwestern.	18		12	769 56		43 75	
22033	Frankfort to Kithama.....	Frankfort and Kithama.....	25.5		13	1,046 52		41 04	

	6	1, 125 17	Pay on 6.58 miles estimated.
Rockport to Jasper.....	0	5, 101 79	42 75
Muncie to Ambia	0	1, 754 46	42 75
Switz City to Bedford.....	0	863 55	42 75
Anderson to Nobleville.....	0	1, 146 55	42 75
Monticello to Rensselaer.....	0	340, 874 88	
ILLINOIS.			
Chicago to Milwaukee, Wis.....	25	19, 926 48	222 00
Chicago to Freeport.....	18	24, 997 44	208 00
Chicago to Union Pacific Transfer.....	12	115, 194 30	{ 289 87
Egin to Geneva.....	18	2, 200 00	{ 191 21
Sterling to East Saint Louis.....	12	17, 437 90	{ 59 85
Kansas to Westfield.....	6	353 97	42 75
Branch, Aurora to Galena Junction.....	36	310 19	{ 332 69
Branch, Galva to Sagetown.....	18	68, 540 37	{ 42 75
Branch, Elmhurst to Buda.....	12	5, 007 72	{ 48 73
Burlington, Iowa, to Quincy, Ill.....	6	6, 925 50	{ 55 57
Streator to Aurora.....	124	128 25	128 25
Branch, Aurora to Batavia.....	12	16, 949 50	109 49
Rock Falls to Shabbona.....	6	3, 808 77	53 01
Chicago to Davenport, Iowa.....	12	3, 580 23	51 30
Bureau Junction to Peoria.....	6	2, 744 12	42 75
Chicago to Alton.....	6	2, 019 08	42 75
Bloomington to Godfrey.....	154	55, 630 16	{ 301 37
Washington to Dwight.....	12	4, 018 50	{ 326 37
Branch, Varna to Lacon.....	184	52, 408 84	85 60
Chicago to Cairo.....	94	19, 361 79	{ 113 61
Dubuque, Iowa, to Centralia, Ill.....	6	3, 443 93	{ 96 61
Joliet to Lake Station, Ind.....	144	55, 407 79	42 75
Decatur to East Saint Louis.....	144	104 70	104 70
Pekin, Lincoln and Decatur.....	12	39, 896 36	{ 107 38
Michigan Central.....	6	1, 800 00	{ 139 88
Toledo, Wabash and Western.....	6	20, 944 00	{ 124 38
Pennsylvania.....	6	3, 000 90	40 00
Pay on 16.56 miles estimated.	6	45 00	187 00

B.—Railroad service as in operation on the 30th of June, 1879—Continued.

Number of route.	State and termini.	Corporate title of company carrying the mail.	Distance.	Total distance in each State.	Number of trips per week.	Annual pay.	Annual pay in each State.	Annual cost per mile on each route.	Remarks.
			Miles.	Miles.		Dollars.	Dollars.	Dollars.	\$400 per annum included for ferrillage.
ILLINOIS—Continued.									
23025	Hannibal, Mo., to Naples, Ill.	Toledo, Wabash and Western.	45.5	.....	6	6,260 50	.....	131 00	
23026	Branch, Mayeville to Pittsfield.	LaFayette, Bloomington and Mississippi.	81.14	.....	6	3,468 73	.....	50 00	
23027	Ambia, Ind., to Bloomington, Ill.	Toledo, Peoria and Warsaw.	228.75	.....	6	16,612 50	.....	42 75	
23028	State Line to Warsaw.	Indianapolis and Saint Louis.	189	.....	12	33,642 00	.....	70 00	
23029	Terre Haute, Ind., to East Saint Louis, Ill.	Indianapolis, Bloomington and Western.	102.7	.....	6	5,635 10	.....	178 00	
23030	Branch, White Heath to Decatur.	Saint Louis, Alton and Terre Haute.	32.35	.....	6	8,544 20	.....	42 75	
23031	East Saint Louis to Du Quoin.	Terre Haute and Indianapolis.	71.8	.....	14	66,035 95	.....	38 47	
23032	East Saint Louis to Terre Haute, Ind.		165.4	.....	13		.....	399 25	
23033	(Saint Louis, Mo., to Nashville, Tenn., McLeansborough to Shawneetown.)	Saint Louis and Southeastern.	162.65	.....	12	23,378 25	.....	71 52	
23034	Shawneetown to Shawneetown.	Ohio and Mississippi.	107.60	.....	12		.....	64 12	
23035	Boardman to Gilman.	Illinois Central.	47.72	.....	13		.....	67 54	
23036	Chicago to Milwaukee, Wis.	Chicago, Milwaukee and Saint Paul.	229.7	.....	6	13,747 54	.....	38 47	
23037	Aurora to Fort Snelling.	Chicago and Iowa.	111.6	.....	6	4,770 90	.....	59 85	
23038	Vincennes to Cairo.	Gairo and Vincennes.	88.23	.....	18	22,057 50	.....	42 75	
23039	Peoria to Jacksonville.	Peoria, Pekin and Jacksonville.	81.64	.....	6	8,677 51	.....	250 00	
23040	Carbondale to Grand Tower.	Grand Tower Mining, Manufacturing and Transportation Co.	158	.....	6	10,131 75	.....	106 29	
23041	Peoria to Rock Island.	Peoria and Rock Island.	84.14	.....	6	4,316 38	.....	64 12	
23042	Quincy to Hannibal, Mo.	Chicago, Burlington and Quincy.	25	.....	6	4,961 87	.....	51 30	
23043	Branch, Fall Creek to Louisiana.	Chicago and Eastern Illinois.	92	.....	6	4,955 58	.....	38 47	
23044	Branch, Bismark to Snoddy's Mills.	Chicago and Peoria.	19.4	.....	19	108 87	.....	53 86	
23045	Branch, Bismark to Snoddy's Mills.	Chicago and Peoria.	30.85	.....	6	4,315 39	.....	72 67	
23046	Branch, Bismark to Snoddy's Mills.	Chicago and Peoria.	107	.....	12	64 12	.....	64 12	
23047	Branch, Bismark to Snoddy's Mills.	Chicago and Peoria.	25.9	.....	12	7,747 15	.....	34 20	
23048	Branch, Bismark to Snoddy's Mills.	Chicago and Peoria.	156.8	.....	6	7,840 00	.....	50 00	
23049	Branch, Bismark to Snoddy's Mills.	Chicago and Peoria.	33.05	.....	6	1,652 50	.....	50 00	
23050	Branch, Bismark to Snoddy's Mills.	Chicago and Peoria.	18	.....	6	810 00	.....	45 00	
23051	Branch, Bismark to Snoddy's Mills.	Chicago and Peoria.	31.39	.....	6	1,207 76	.....	38 47	
23052	Branch, Bismark to Snoddy's Mills.	Chicago and Peoria.	42	.....	6	2,118 00	.....	50 44	

23048	Terre Haute, Ind., to Peoria, Ill.	179.93	6	8,998.50	59.00
23049	Springfield to Havana	48.2	84	3,199.00	44.00
23050	Vincennes, Ind., to Danville, Ill.	114.19	6	5,076.89	44.46
23051	Joliet to Peoria	138.02	6	5,070.90	45.00
23052	Courland Station to Sycamore	5	12	420.00	54.00
23053	East Saint Louis to Cairo	148.5	6	7,110.18	47.88
23054	Chicago to Byron	90.84	6	3,405.84	38.474
23055	Decatur to Bruin's Junction, Ind.	101.97	6	4,359.22	42.75
23056	Geneva to Rockford	3.5	6	175.00	50.00
23057	Rockville to Rockford	97.64	6	1,191.61	42.75
23058	West Lebanon to Le Roy	70.625	6	3,275.72	42.75
23059	Rock Island to Mercer County	28.12	6	1,116.63	42.75
23060	Warsburg to Mattoon	68.66	6	1,741.50	23.70
23061	El Dorado to Cave	32.89	6	1,408.04	42.75
23062	Kankakee to Chatsworth	41.78	6	1,786.09	42.75
MICHIGAN.					
24001	Toledo, Ohio, to Detroit, Mich.	65.27	54	7,366.37	112.86
24002	Monroe to Adrian	35.23	12	2,409.73	68.40
24003	Adrian to Jackson	47.25	6	2,625.92	55.574
24004	White Pigeon to Grand Rapids	95.67	9	7,361.81	76.95
24005	Detroit to Chicago, Ill.	284	324	83,332.00	223.00
24006	Detroit to Grand Haven	189.67	15	18,649.30	98.324
24007	Detroit to Fort Huron	64.5	15	6,791.85	105.30
24008	Jackson to Fort Wayne, Ind.	96.82	6	5,629.11	58.14
24009	Jackson to Gaylord	169	84	12,834.40	60.00
24010	Jackson to Grand Rapids	67.36	84	40.00	40.00
24011	Lenox to Rochester	94.86	12	8,537.40	90.00
24012	Detroit to Bay City	26.55	12	1,135.01	42.75
24013	Toledo to Ludington	108.97	12	9,262.45	85.00
{ 82.08 }					
{ 65.66 }					
{ 96.00 }					
{ 40.00 }					
24015	Branch, Otter Lake Junction to Otter Lake, Mich.	171.17	124	22,543.55	60.00
24017	Branch, East Saginaw to Bay City	83.32	124	12,844.26	78.00
24018	Detroit to Lansing and Lake Michigan	14.53	27	13,900.86	53.354
24019	Grand Rapids and Indiana	12.75	114	1,987.00	50.00
24020	Kalamazoo to South Haven	164.67	94	7,105.05	42.75
24021	Chicago and Lake Huron	260.55	6	15,798.12	82.00
24022	Chicago and Michigan Lake Shore	39.74	12	2,846.72	42.75
24023	Chicago and Lake Huron	164.2	6	2,405.32	42.75
24024	Grand Haven	170.56	144		
24025	New Buffalo to Pent Water	26.65	12		
24026	Branch, Holland to Grand Rapids	66.59	6		
24027	Port Huron to Flint	58.37	6		
24028	Algonquin to Muskegon		9		



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B.—Railroad service as in operation on the 30th of June, 1879—Continued.

Number of route.	State and terminal.	Corporate title of company carrying the mail.	Distance. Miles.	Total distance in each State. Miles.	Number of trips per week.	Annual pay. Dollars.	Annual pay in each State. Dollars.	Annual cost per mile on each route. Dollars.	Remarks.
MICHIGAN—Continued.									
24094	Ypsilanti to Bankers.	Detroit, Hillsdale and Southwestern.	65.54		6	3,277 00		50 00	
24025	Jackson to Niles.	Michigan Central.	104.57		6	5,437 64		52 00	
24096	Grand Rapids to White Cloud.	Grand Rapids, Newaygo and Lake Shore.	26.27		6	2,297 70		50 00	
24097	Niles to South Bend, Ind.	Michigan Central.	10.76		6	610 00		45 00	
24098	Ypsilanti to Lansing.	Lake Shore and Michigan Southern.	40.87		6	3,018 54		49 50	
24099	East Saginaw to Saint Louis.	Saginaw Valley and Saint Louis.	85.23		6	1,506 08		42 75	
24031	Fort Howard, Wis., to Lehigh, Mich.	Chicago and Northwestern.	180.3		7	11,099 27		61 56	
24032	Mankagon to Big Rapids.	Chicago and Michigan Lake Shore.	58.64		6	2,548 80		45 00	Pay on 16.81 miles estimated.
24033	Ionis to Blanchard.	Detroit, Lansing and Lake Michigan.	42.12		6	2,106 00		50 00	
24034	Walton to Traverse City.	Continental Improvement Company.	28.26		6	1,122 62		43 75	
24035	Toledo, Ohio, to Detroit, Mich.	Toledo, Canada Southern and Detroit.	98.07		14½	5,361 08		52 00	
24036	Grosse Ile to Fayette, Ohio.	Chicago and Canada Southern.	17.32		14½	3,515 00		103 00	
24037	Saint Clair to Richmond.	Michigan Midland and Canada.	76.8		6	838 00		50 00	
24038	Wilton to Potosi.	Grand Rapids and Indiana.	16.76		12	2,901 67		38 98½	
24039	Wint to Lansing.	Chicago and Northwestern.	71.96		7	2,145 19		38 47½	
24040	Saint Louis to Edmore.	Chicago, Saginaw and Canada.	50.18		6	3,299 98		45 82½	Pay on 3.32 miles estimated.
24041	Marquette to L'Anse-au-Loup.	Marquette, Houghton and Ontonagon.	22.39		6	839 06		34 20	Pay estimated.
24042	Branch, Humboldt to Republic.	Chicago and Northwestern, operating Menominee River Railroad.	9.7		6	1,055 07		43 75	
24043	East Saginaw to Cairo.	Detroit and Bay City.	88.73		6	1,837 46		42 75	Do.
24044	Toledo, Ohio, to Ann Arbor, Mich.	Toledo and Ann Arbor.	45.62		6	1,940 25		43 75	Do.
24045	Port Huron to Croswell.	Port Huron and Northwestern.	28.26	3,731.23	6	1,207 68	283,021.19	43 75	Do.
WISCONSIN.									
24001	Milwaukee to North McGregor, Iowa.	Chicago, Milwaukee and Saint Paul.	107.2		9	24,650 00		126 00	

25002	Milwaukee to La Crosse.	90.88	12	46,824 79	289 99
25003	Milwaukee to Berlin.	61.8	12		289 99
25004	Milwaukee to Monroe	16.8	12		219 00
25005	Wetmore to Madison	25.76	12		68 40
25006	Hericon to Portage	24.8	12	6,484 32	58 00
25007	Nepesukun to Winneconne	38.45	6	2,482 40	50 00
25008	Oshkosh to Ripon	45.25	6	2,262 50	50 00
25009	Chicago, Ill., to Green Bay, Wis.	16.25	6	731 25	45 00
25010	Chicago and Northwestern	21	12	1,050 00	50 00
25011	Chicago, Ill., to Green Bay, Wis.	176.7	144	51,943 84	230 00
25012	Caledonia Station, Ill., to Winona	68.5	144		169 86
25013	Winona, Minn., to Winona Junction, Wis.	135.45	144		132 00
25014	Kenosha to Rockford, Ill.	54.9	12	21,722 40	70 00
25015	La Crosse, Trempealeau and Prescott.	73.6	6	5,520 00	75 00
25016	Chicago and Northwestern	30.45	12	5,176 50	170 00
25017	Chicago, Saint Paul and Minneapolis.	63.53	6	4,320 04	68 00
25018	Green Bay and Minnesota	199	12	12,061 57	60 194
25019	Wisconsin Central	3.25	6		25 65
25020	Green Bay to Winona, Minn.	216.43	6	11,253 32	52 00
25021	Milwaukee to Green Bay	111.54	6	7,305 74	51 30
25022	Branch, Albert to Menasha	16	6		46 17
25023	Menasha to Ashland	251.02	6	11,589 59	75 00
25024	Milwaukee, Lake Shore and Western.	85	12		45 30
25025	Sheboygan and Fond du Lac	44.5	6	10,053 82	42 75
25026	Mineral Point	21.06	6		50 00
25027	Wisconsin Valley	13.94	6	4,012 50	42 75
25028	Chicago, Milwaukee and Saint Paul, operating Chicago and Superior Railroad.	79.05	6		42 75
25029	Galena and Southern Wisconsin	23	6	1,410 75	42 75
25030	Wisconsin Central	18.7	6	935 00	42 75
25031	North Wisconsin	90.04	6	3,849 21	42 75
25032	Pine River Valley and Stevens Point	39.5	6	1,688 62	42 75
25033	Chicago and Northwestern	196.4	12	14,207 54	68 40
25034	Chicago, Milwaukee and Saint Paul	18.1	6		42 75
25035	Chicago, Milwaukee and Saint Paul	30.69	6	1,312 00	42 75
25036	Chicago and Tomah	11.67	12	488 89	42 75
25037	Chicago, Milwaukee and Saint Paul	73.23	6	3,381 02	46 17
25038	Chicago, Milwaukee and Saint Paul	58.07	6	2,525 24	42 75
25039	Chicago, Milwaukee and Saint Paul	16.5	6	705 37	42 75
25040	Chicago, Milwaukee and Saint Paul	6.5	6	277 87	42 75
25041	Chicago, Milwaukee and Saint Paul	12.76	6	545 49	42 75
25042	Chicago, Milwaukee and Saint Paul	30.91	6	1,321 40	42 75
25043	Chicago, Milwaukee and Saint Paul	12.2	6	521 55	42 75
25044	Chicago, Milwaukee and Saint Paul	13.19	6	563 87	42 75
25045	Chicago, Milwaukee and Saint Paul	2,955.15	6	285,290 40	42 75

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B.—Railroad service as in operation on the 30th of June, 1879—Continued.

Number of route.	State and termini.	Corporate title of company carrying the mail.	Distance.	Total distance in each State.	Number of trips per week.	Annual pay.	Annual pay in each State.	Annual cost per mile on each route.	Remarks.
			<i>Miles.</i>	<i>Miles.</i>		<i>Dollars.</i>	<i>Dollars.</i>	<i>Dollars.</i>	
MINNESOTA.									
26001	Duluth to Bemarck, Dak.	Northern Pacific.	185.12	185.12	3	23,834 80	40 00	{ 23 miles lap service included in route No. 26007.
26002	Saint Paul to Breckinridge	Saint Paul and Pacific.	229	229	8	8,311 58	.....	70 00
26003	Saint Paul to Saint Rapids	do	216 90	216 90	8	8,311 58	.....	38 30
26004	East Saint Cloud to Alexandria	do	78 3	78 3	9	3,899 81	49 93	Pay on 34.44 miles estimated.
26005	Saint Paul to Saint James	Saint Paul and Sioux City	69.5	69.5	6	2,367 05	.....	36 93
26006	White Bear Lake to Albert Lea.	Saint Paul and Saint Louis.	122 84	122 84	12	8,891 89	.....	72 54
26007	Saint Paul to Duluth.	Minneapolis and Saint Louis.	82 35	82 35	9	7,752 73	69 25	Pay on 81.73 miles estimated.
26008	White Bear Lake to Stillwater.	Lake Superior and Mississippi.	41	41	9	9,480 21	.....	50 00
26009	Mendota to McGregor, Iowa.	Chicago, Milwaukee and Saint Paul.	135.73	135.73	12	600 00	.....	60 87
26010	Hastings to Montevideo.	do	113.2	113.2	6	16,059 50	95 00	Pay on 46.87 miles estimated.
26011	Winona to La Crosse, Wis.	do	156.32	156.32	6	4,276 91	.....	64 88
26012	Austin to Mason City, Iowa.	do	28.75	28.75	12	5,192 54	.....	27 36
26013	Minneapolis to Winona.	do	41.38	41.38	12	2,069 00	180 61	Pay on 46.87 miles estimated.
		do	103.84	103.84	12	19,594 34	.....	50 00
		do	6.4	6.4	12	.....	.....	178 00
26014	Saint Peter to Gary, Dak.	Winona and Saint Peter.	8.85	8.85	12	63 61	Pay on 46.87 miles estimated.
26015	Winona to Saint Peter.	do	30	30	6	4,761 67	.....	79 59
26016	La Crosse, Wis., to Jackson, Minn.	do	79.66	79.66	6	.....	.....	20 53
26017	Mankato to Wells.	Southern Minnesota	40.97	40.97	6	7,988 16	43 77	Pay on 46.87 miles estimated.
26018	Saint James to Lemars, Iowa.	Central Railroad Company of Minnesota.	140.5	140.5	6	10,048 84	.....	54 72
26019	Worthington to Saint Vincent.	do	3.75	3.75	6	1,404 25	.....	46 51
26020	Branch, Groutman to Fisher's Landing.	Saint Paul and Pacific.	217.38	217.38	6	34 20	Pay estimated.
26021	Branch, Groutman to Braden.	do	41.06	41.06	6	6,721 25	.....	54 72
26022	Branch, Groutman to Braden.	do	122 83	122 83	6	2,864 61	.....	47 02
26023	Branch, Groutman to Braden.	do	292 25	292 25	6	9,183 04	42 75	Do.
26024	Branch, Groutman to Braden.	do	12 09	12 09	6	2,908 04	.....	42 75
		do	60 06	60 06	6	1,140 14	.....	42 75
		do	59 68	59 68	6	1,226 97	42 75	Do.
		do	26 67	26 67	6	42 75	Do.
		do	26 08	26 08	6	42 75	Do.

28025	Rochester to Zumbrota	do	28.12	2,934.68	6	1,116.63	104,911.61	42.75	Do.
	IOWA.								
27001	Burlington to Albert Lea, Minn.	Burlington, Cedar Rapids and Northern.	253.47		6	18,420.93		72.67 1/2	Pay on 33.93 miles estimated.
27002	Cedar Rapids to Postville.	do	99.8		6	4,351.79		43.60 1/2	
27003	Cedar Rapids to Holland	do	50.45		6	2,156.74		42.75	Pay on 25.68 miles estimated.
27004	Maquoketa to Riverdale	do	32.23		6	1,377.83		42.75	
27005	(Burlington to Pacific Junction to East Branch, Pacific Junction to East Branch, Red Oak to Eastport.)	Burlington and Missouri River.	238.14		6	56,294.62		183.64	
27006	Chariton to Leon	do	50		6	1,900.56		34.20	
27007	Chariton to Hopkiss, Mo.	do	37.44		6	2,467.53		46.51 1/2	
27008	Uniontown to Leadville, Mo.	do	44.4		6	2,467.53		42.75	
27009	Vienna to Clarinda	Burlington and Northwestern.	183.52		6	8,159.29		44.46	
27010	Albia to Marion City	Burlington and Missouri River.	16		6	864.00		42.75	
27011	Keokuk to Burlington	Central Railroad Company of Iowa	169.58		6	9,569.40		56.43	
27012	Clinton to La Crescent Junction.	Chicago, Burlington and Quincy.	42.75		12	2,851.00		66.69	
27013	Stanwood to Tipton	Chicago, Dubuque and Minnesota.	173.77		12	12,224.36		98.00	
27014	Davenport to Missouri River	Chicago and Northwestern	8.81		6	440.50		50.00	
		Chicago, Rock Island and Pacific	54		12	62,590.44		217.58	
27015	(Des Moines to Indianapolis to French, Summeret Junction to Winteret.)	do	21.4		6	2,164.86		192.58	
27016	Washington to Knoxville	do	27.1		6	3,367.51		47.02 1/2	
27017	Wilkes Junction to Leavenworth, Kans.	do	79.24		12	23,457.31		42.75	Pay on 25.23 miles estimated.
27018	Davenport to Maquoketa	Davenport and Saint Paul	42.76		6	1,827.99		72.67 1/2	
27019	Keokuk to Des Moines	do	162.81		12	12,373.56		76.00	
27020	Payette to Cedar Rapids	Keokuk and Des Moines	55.87		6	2,879.24		52.00	
27021	Dubuque to Sioux City	Dubuque and Northwestern	327.12		12	27,988.76		85.50	
27022	Waterloo to Mona	Illinois Central	16		12	5,940.00		73.00	
27023	Renah to Elkader	do	16.50		6	5,979.50		50.00	
27024	Clinton to Anamosa	Iowa Eastern	74.1		6	3,705.00		50.00	
27025	Calmar to Pattersonville.	Iowa Midland	223.83		6	8,903.76		38.96 1/2	Pay on 98.03 miles estimated.
27026	Conover to Davenport	Chicago, Milwaukee and Saint Paul	8.5		12	6,592.50		55.00	
27027	Davenport to Fayette	do	123.33		6	5,639.44		43.60 1/2	
27028	Savanna, Ill., to Marton, Iowa.	Davenport and Saint Paul	90.25		6	4,512.50		50.00	
		Paul.							
27029	(Missouri Valley to Sioux City to Branch, California Junction to Fremont.)	St. Louis City and Pacific	76		6	12,653.57		90.63	
27030	Des Moines to Callanan	do	63.4		6	42.75		42.75	
270 11	Des Moines to Fort Dodge	do	51.47		6	42.75		42.75	
270 12	Grinnell to Montezuma	do	37.12		6	3,011.96		50.57 1/2	
270 13	Albia to Knoxville	Des Moines and Minnesota	20.8		6	4,034.84		43.31 1/2	
270 14	Sioux City to Beloit	Des Moines and Fort Dodge	99.04		6	6,550.56		42.75	
270 15	Burlington to Winfield.	Central Railroad Company of Iowa	14.75		6	1,432.23		42.75	
		Chicago, Burlington and Quincy.	33.97		6	2,786.44		42.75	Pay on 35.17 miles estimated.
		Sioux City and Paulina	65.18		6			42.75	
		Burlington and Northwestern.	18.82		6	804.56		42.75	

B.—Railroad service as in operation on the 30th of June, 1879.—Continued.

Number of route.	State and termini.	Corporate title of company carrying the mail.	Distance.	Total distance in each State.	Number of trips per week.	Annual pay.	Annual pay in each State.	Annual cost per mile on each route.	Remarks.
			Miles.	Miles.		Dollars.	Dollars.	Dollars.	
IOWA.—Continued.									
27036	Newton to Monroe	Newton and Monroe	17.9		6	688 70		38 47½	
27037	Judd to Lehigh	Crooked Creek Railroad and Coal Company.	8.5		6	327 03		38 47½	
27038	Maple River to Mapleton	Chicago and Northwestern, leasee.	61.18		6	2,353 90		38 47½	
27039	Turkey River to Wadena	Chicago, Dubuque and Minnesota	44.05		6	1,883 14		42 75	
27040	Adams to Fontanelle	Waukon and Mississippi	22.98		6	884 16		38 47½	
27041	Creston to Fontanelle	Chicago, Burlington and Quincy	30.7		6	1,312 42		42 75	
27042	Chariton to Indianola	do	34.69		6	1,457 35		42 75	
27043	Hastings to Sidney	do	21.07		6	990 74		42 75	
27044	Atlantic to Audubon	Chicago, Rock Island and Pacific	25.84		6	1,104 66		42 75	
27045	Avoca to Harlan	do	14.89		6	630 55		42 75	
27046	Adel to Waukeo	Des Moines, Adel and Western	7.34		6	318 78		42 75	
27047	Fort Dodge to Humboldt	Fort Dodge and Fort Ridgely	18.5	4,288.12	6	790 87	325, 278 35	42 75	Pay estimated. Do. Do. Do. Do. Do.
MISSOURI.									
28001	Saint Louis to Leavenworth, Kans.	Missouri Pacific	245		13½	103,018 64		323 67½	
28002	Saint Louis to Bismarck	Saint Louis, Iron Mountain and Southern.	87		13½			274 94	
28003	Saint Louis to Mineral Point to Potosi	do	47.75		13½			283 67½	
28004	Saint Louis to Vinita, Ind. T.	do	77.73		6	18,442 99		235 07	
28005	Saint Louis to Kansas City	Saint Louis and San Francisco	327.25		6	28,200 81		42 75	
28006	Quincy, Ill., to Saint Joseph, Mo.	Saint Louis, Kansas City and Northern.	87		6	36,651 11		78 68	
28007	Branch, Palmyra to Hannibal	Hannibal and Saint Joseph	276.56		14½			66 46½	
28008	Branch, Palmyra to Union, Pacific Transfer Company.	do	171		13			132 52½	
28009	Moherly to Ottumwa, Iowa	Kansas City, Saint Joseph and Council Bluffs.	32.5		7	34,714 71		172 08	
28010	Tipton to Booneville.	Saint Louis, Kansas City and Northern.	15		13			147 08	
28011	Centralia to Columbia	do	203.5		14	28,708 76		34 20	
28012	Kansas City to Cameron	Saint Louis, Kansas City and Northern.	131		6	8,060 40		141 07½	
28013	do	do	25		6	1,090 18		68 40	
28014	do	do	22		6	940 50		43 00½	
28015	do	do	54		13	12,696 00		42 75	
									\$730 per annum included for carrying.

28011	Sedalia to Donelson City, Tex.	Missouri, Kansas and Texas	422.92	7	76,670.43	172.91
28012	Saint Joseph to Lexington	Saint Louis, Kansas City and Northern.	22.5	7	3,346.68	143.83
28013	Brunswick to Pattonaburgh	Brunswick and Chillicothe and Saint Louis, Council Bluffs and Omaha.	76.75	7	48.784	48.66
28014	Hannibal to Sedalia	Missouri, Kansas and Texas.	80.05	6		
28015	Kookuk, Iowa, to Centerville	Missouri, Iowa and Nebraska.	142.88	13	21,529.87	150.684
28016	Pleasant Hill to Stanley	Saint Louis, Lawrence and Western.	5.79	6	4,683.01	60.71
28017	Sedalia to Lexington	Missouri Pacific.	85.63	6	1,090.12	50.00
28018	Kookuk, Iowa, to Clarksville, Mo.	Saint Louis, Kookuk, and Northwestern.	23.5	6	2,404.60	42.75
28019	Quincy, Ill., to Norvinner, Mo.	Quincy, Missouri and Pacific.	50.25	6	6,829.15	75.00
28020	Quincy, Ill., to Norvinner, Mo.	Missouri and Western.	60.72	6	4,588.24	64.124
28021	Quincy, Ill., to Norvinner, Mo.	Chicago and Alton.	35.48	12	5,252.51	58.00
28022	Quincy, Ill., to Norvinner, Mo.	do.	70.28	13	2,164.01	65.834
28023	Quincy, Ill., to Norvinner, Mo.	Saint Louis, Salem and Little Rock.	73.76	6	11,148.75	42.50
28024	Quincy, Ill., to Norvinner, Mo.	Missouri, Kansas and Texas.	9.33	6	1,165.08	123.874
28025	Quincy, Ill., to Norvinner, Mo.	Saint Louis, Kansas City and Northern.	50.62	3	2,750.00	38.50
28026	Bismarck to Texarkana, Ark.	Saint Louis, Iron Mountain and Southern.	40.88	6	669.47	50.00
28027	Cairo, Ill., to Poplar Bluff, Mo.	do.	55	12	75,190.11	42.75
28028	Saint Joseph to Hopkins	do.	15.66	7	2,521.57	210.534
28029	Hannibal to Prairieville	do.	90.24	6	3,680.78	173.424
28030	Saint Joseph to East Arizabon	do.	73.73	6	1,834.87	34.20
28031	Saint Joseph to Fort Smith	do.	61.5	6	1,887.84	59.85
28032	Arizabon, Kans., to Edgerton Junction, Mo.	do.	47.69	6	1,824.87	38.474
28033	Kansas City to Lexington	do.	22.08	13	1,812.25	85.50
28034	Bismarck to Columbus, Ky.	do.	19	6	1,275.00	42.75
28035	New Madrid to Malden	do.	30	6	1,853.21	42.50
28036	Springfield to Ash Grove	do.	43.35	6	8,973.87	42.75
28037	Saint Joseph to Union Star	do.	119.27	6	1,042.67	38.474
28038	Mexico to Kansas City	do.	27.1	6	1,958.42	42.75
		do.	24.08	6	1,131.35	42.50
		do.	22.62	6	6,989.32	42.50
		do.	104.69		530,578.56	
		do.	4,204.65			
28001	Hopfield to Little Rock.	Memphis and Little Rock.	134.21	7	12,576.81	93.71
28002	Helena to Clarendon	Arkansas Central.	48.3	6	2,060.55	42.75
28003	Argenta to Fort Smith	Little Rock and Fort Smith.	169.29	6	9,859.33	59.85
28004	Pine Bluff to Collins.	Little Rock, Mississippi River and Texas.	95.5	6	4,038.75	42.50

ARKANSAS.

B.—Railroad service as in operation on the 30th of June, 1879—Continued.

Number of route.	State and termini.	Corporate title of company carrying the mail.	Distance.	Total distance in each State.	Number of trips per week.	Annual pay.	Annual pay in each State.	Annual cost per mile on each route.	Remarks.
			<i>Miles.</i>	<i>Miles.</i>		<i>Dollars.</i>	<i>Dollars.</i>	<i>Dollars.</i>	
29005	ARKANSAS—Continued.								
29006	Malvern Junction to Hot Springs. Brinkley to Cotton Plant	Hot Springs Brinkley and Cotton Plant	25.11 11.06	483.87	6 6	1,352.67 470.05		53.87 42.50	Pay estimated.
	LOUISIANA.								
30001	New Orleans to Canton, Miss.	New Orleans, Saint Louis and Chicago.	208.1		13	23,179.78		140.22	
30002	New Orleans to Donaldsonville	New Orleans and Texas	64.32		6	2,749.68		42.75	
30003	New Orleans to Morgan City	Morgan's Louisiana and Texas	85		7	6,221.15		73.19	
30004	Terre Bonne to Houma	do	15.33		7	655.35		42.75	
30005	Baton Rouge to Livonia	Baton Rouge, Grosse Tête and Opelousas.	30		3	769.50		25.65	
30006	Clinton to Port Hudson	Clinton and Port Hudson	21		3	539.65		25.65	
30007	Saint Francisville to Woodville, Miss.	West Feliciana	28.23		3	844.92		29.83	
30008	Vicksburg, Miss., to Monroe, La.	Vicksburg, Shreveport, and Texas	76.16		7	3,542.96		46.52	
30009	Terre Bonne to Thibodeaux	Morgan's Louisiana and Texas Railroad and Steamship Comp'y.	5.75		6	245.81		42.75	Pay estimated.
	TEXAS.								
31001	Houston to Galveston	Galveston, Houston and Henderson	51.5	533.89	14	7,045.20		136.80	
31002	Harrisburgh to San Antonio	Galveston, Harrisburgh and San Antonio.	215		6	22,241.75		103.45	
31003	Houston to Denison City	Houston and Texas Central	387.45		7	43,855.00		129.96	
31004	Houston to Austin	do	115.2		7	7,790.60		67.54	
31005	Houston to Austin	do	44.99		13	3,053.23		69.23	
	Longview to Houston	do	237.5		6			141.08	
31006	San Antonio to Houston	International and Great Northern	44.7		12	35,892.17		42.75	
31007	Houston to Austin	do	183.92		6	15,255.15		42.75	
31008	Houston to Austin	do	50.75		7	1,898.52		52.94	
31009	Houston to Austin	do	250.04		13	22,932.87		104.31	
31010	Houston to Austin	do	74.96		7	7,532.44		100.89	
31011	Houston to Austin	do	155.22		6	11,147.90		71.82	
31012	Houston to Austin	do	105.34		6	4,541.76		43.75	

31013	Jefferson to Sulphur Springs.....	91.06	6	3,918.46	42.75	Pay on 42.46 miles estimated.
31014	Tyler to Big Sandy.....	92.05	7	842.49	42.75	
31015	Henderson to Overton.....	15.58	0	685.80	42.75	Pay estimated.
31016	Corpus Christi to Collins.....	40	6	1,710.00	42.75	Do.
31017	Denison City to White Wright.....	21.33	6	307.55	42.75	Do.
31018	Brownsville to Brazos Santiago.....	38.04	6	1,198.71	42.75	Do.
31019	Indianola to Chero.....	66.8	6	2,855.70	42.75	Do.
KANSAS.						
32001	Kansas City, Mo., to Denver, Colo.....	640.1	9	84,832.45	132.53	
32002	Lawrence to Leavenworth.....	85.45	7	2,347.75	84.13	
32003	Atchison to Waverly.....	190.5	6	2,765.77	67.55	
32004	Lawrence to Coffeyville.....	146.8	6	3,379.00	49.51	
32005	Cherry Vale to Independence.....	10.87	6	827.20	76.10	
32006	Ottawa to Ottawa.....	34.36	6	3,261.10	84.91	
32007	Elwood to Herington, Nebr.....	225.5	6	14,525.44	64.13	
32008	Kansas City, Mo., to Baxter Springs, Kans.....	164.79	13	16,416.76	100.89	
32009	Junction City to Parsons.....	157.44	6	8,668.05	54.04	
32010	Atchison to Pueblo, Colo.....	470.41	8	69,995.37	106.71	
32011	Newton to Wichita.....	148.44	8	133.38	133.38	
32012	Atchison to Lincoln, Nebr.....	27.69	7	2,301.90	78.42	
32013	Leavenworth to Omaha.....	151.33	6	10,896.66	72.68	
32015	Junction City to Olathe.....	84.35	6	3,000.83	42.75	
32016	Topeka to Kansas City, Mo.....	58.3	6	2,551.53	45.32	
32017	Flournoe to El Dorado.....	66.2	204	8,842.85	185.99	Pay on 5.7 miles estimated.
32018	Fort Scott to Arcadia.....	30.75	6	1,314.56	42.75	
32019	Fort Scott, Southeastern and Memphis.....	17.13	6	527.26	30.78	
32020	Ottawa to Burlington.....	47.65	6	2,464.12	53.01	
32021	Grand to Joplin, Mo.....	87.3	6	1,494.57	42.75	
32022	Waverly to Washington.....	20.5	6	1,104.33	53.87	
32023	Greenleaf to Concordia.....	41.97	6	2,294.82	53.01	
32024	Parsons to Moberg, Mo.....	43.75	6	1,970.31	42.75	Pay on 12.63 miles estimated.
32025	Solomon City to Minneapolis.....	23.25	6	1,162.50	50.00	Pay estimated.
32026	Concordia to Cawker City.....	48.35	6	2,417.50	50.00	Do.
32027	Concordia to Scandinavia.....	19.96	6	968.00	50.00	Do.
NEBRASKA.						
34001	Council Bluffs, Iowa, to Ogden City, Utah.....	1,035.2	7	375,884.56	364.05	
34002	Plattsmouth to Kearney.....	190.8	6	17,292.20	90.68	

B.—Railroad service as in operation on the 30th of June, 1879—Continued.

Number of route.	State and terminal.	Corporate title of company carrying the mail.	Distance.	Total distance in each State.	Number of trips per week.	Annual pay.	Annual pay in each State.	Annual cost per mile on each route.	Remarks.
			Miles.	Miles.		Dollars.	Dollars.	Dollars.	
NEBRASKA—Continued.									
34003	Omaha to Tekamah	Omaha and Northwestern	48.35	.....	6	2,232 31	.....	46 17	Pay on 5.05 miles estimated.
34004	Omaha to Oresopolis Junction	Burlington and Missouri River in Nebraska	17.76	.....	6	1,609 58	.....	90 63	
34005	Nemaha City to York	Nebraska	137.69	.....	6	6,711 01	.....	48 74	
34006	Crete to Beatrice	Burlington and Missouri River in Nebraska	30.6	.....	6	1,412 80	.....	46 17	
34007	Covington to Ponca	Nebraska	26.5	.....	6	1,122 87	.....	42 75	Pay estimated. Do.
34008	Valley to Rising City	Covington, Columbus and Black Hills	71.09	.....	6	3,403 78	.....	47 88	
34009	Hastings to Washington	Omaha and Republican Valley	72.98	.....	6	3,649 50	.....	50 00	
34010	Promont to Waver	Republican Valley	51.47	.....	6	2,573 50	.....	50 00	
		Sioux City and Pacific	1,632.45	.....			418,882 11		
35001	Sioux City, Iowa, to Yankton, Dak.	Dakota Southern	61.71	61.71	6	4,220 96	4,220 96	68 40	
COLORADO.									
38001	Denver to El Moro	Denver and Rio Grande	202.2	.....	7	20,937 58	.....	87 21	Pay estimated. Do.
38002	Branch, Pueblo to Canon City .....	.....	45	.....	6	1,186 31	.....	42 75	
	Hughes Station to Bonlder	Denver and Boulder Valley	27.75	.....	6		.....	69 26	
	Denver to Cheyenne City, Wyo. .....	.....	126.63	.....	7	12,046 78	.....	55 58	
38003	Branch, Golden Junction to Georgetown	Colorado Central	37.73	.....	7		.....	46 17	
	Branch, Forks Creek to Central City .....	.....	12.07	.....			.....	81 23	
38004	Cuchara to La Veta	Denver and Rio Grande	22.56	.....	6	1,831 72	.....	43 76	
38005	Denver to Webster .....	.....	62.1	.....	6	3,351 53	.....	42 75	
	Branch, Bear Creek Junction to Morrison	Denver, South Park, and Pacific	10	.....	6	2,427 11	.....	68 40	
38006	La Junta to Trinidad	Atchison, Topeka and Santa Fe	81.87	.....	6	7,260 40	.....	43 76	
38007	Denver to Cheyenne City, Wyo.	Denver Pacific Railroad and Telegraph Company	106	.....	6	288 56	.....	43 76	
38008	Boulder to Marshall	Boulder and Carlton	6.75	768.13	6		50,409 86		

UTAH TERRITORY.					
41001	Ogden City to Salt Lake City.....		Utah Central.....	82.15	98.04
41002	Salt Lake City to York.....		Utah Southern.....	75.96	78.06
41003	Ogden City to Franklin, Idaho.....		Utah Northern.....	71.94	100.89
41004	Sandy to Bingham Canyon.....		Bingham Canyon and Camp Floyd.....	22.5	42.75
41005	Salt Lake City to Stockton.....		Utah Western.....	40.5	42.75
41006	Sandy to Alta.....		Wasatch and Jordan Valley.....	16.78	42.75
				272.87	31,116.40
WASHINGTON TERRITORY.					
43001	Yelm to Wilkeson.....		Northern Pacific.....	136.23	63.27
43002	Seattle to New Castle.....		Seattle and Walla Walla.....	20.28	42.75
43003	Olympia to Tenino.....		Thurston County Railroad Construction Company.....	15.31	42.75
				171.92	10,147.06
OREGON.					
44001	Portland to Roseburg.....		Oregon and California.....	199.1	99.18
44002	Portland to Saint Joseph.....		Oregon Central.....	48.61	42.75
44003	Dayton to Sheridan.....		Willamette Valley.....	26.18	42.75
				273.89	22,943.99
NEVADA.					
45001	Virginia City to Reno.....		Virginia and Truckee.....	51.75	82.94
45002	Palisade to Eureka.....		Eureka and Palisade.....	91.27	58.14
				143.02	9,598.57
CALIFORNIA.					
46001	San Francisco to Ogden City, Utah.....		Central Pacific.....	895.64	327.88
46002	San Francisco to Soledad.....		Southern Pacific.....	143.8	73.19
46003	Beauchamp, Gilroy to True Pine.....		Central Pacific.....	20.2	42.75
46004	Roseville to Redding.....		Placerville and Sacramento Valley.....	151.45	123.98
46005	Folsom City to Shinglet Springs.....		Sacramento Valley.....	28.5	44.46
46006	Sacramento City to Folsom City.....		California Pacific.....	23.2	54.72
46007	Sacramento City to San Francisco.....		do.....	98.72	77.81
46008	Davisville to Graton.....		do.....	18.24	45.32
46009	Napa Junction to Calistoga.....		California Northern.....	34.6	51.30
46010	Marysville to Ukiah.....		Central Pacific.....	20	47.88
46011	Lathrop to Goshute.....		San Francisco and North Pacific.....	146.8	135.09
46012	Stockton to Cloverdale.....		Stockton and Copperopolis.....	90	73.53
46013	Branch, Peters to Oakdale.....		Southern Pacific.....	30	64.98
46014	Wilmington to Los Angeles.....		do.....	19	42.75
46015	Huron to Yuma, Ariz.....		Vaca Valley and Clear Creek.....	21.75	42.75
46016	Elmira to Madison.....			530.29	75.24
				29	42.75

B.—Railroad service as in operation on the 30th of June, 1879.—Continued.

Number of route.	State and termini.	Corporate title of company carrying the mail.	Distance. Miles.	Total distance in each State. Miles.	Number of trips per week.	Annual pay. Dollars.	Annual pay in each State. Dollars.	Annual cost per mile on each route.	Remarks.
46016	CALIFORNIA—Continued. { San Francisco to Duncan's Mills } { Branch, San Anselmo to San } { Quentin. }	North Pacific Coast	86.47		6	4,432.45		Dollars. 82.16	
46017	Los Angeles to Santa Ana	Southern Pacific	5.5		6	2,132.43		42.75	
46018	Visalia to Goshen	Visalia	34.64		6	337.81		61.56	
46019	Codex to Nevada City	Nevada County Narrow Gauge	8.37		6	1,131.14		42.75	
46020	Los Angeles to Santa Monica	Los Angeles and Independence	22.81		6	718.90		42.75	
46021	Santa Cruz to Watsonville	Santa Cruz	16.8		6	969.62		42.75	
46022	Woodland to Willow	Northern	23.29		6	2,267.19		42.75	
46023	Galt to Lone Valley	Amador Branch	65.19		6	1,475.79		54.32	
46024	West Oakland to Berkeley	Central Pacific	27.84		6	232.22		53.01	
46025	Santa Cruz to Felton	Santa Cruz and Felton	5.9		6	337.81		42.75	
46026	San Francisco to Alameda	Central Pacific	13.54		6	656.14		46.17	
46027	Felton to Guerneville	San Francisco and North Pacific	14.09		6	639.14		66.46	
46028	San Francisco to Tracy Junction	Central Pacific	71.73		6	5,151.64		71.52	
46029	Niles Junction to San Jose	do	14.07		12	973.43		28.87	
46030	Monterey to Salinas	Monterey and Salinas Valley	21	2,736.5	6	897.75	431,909.01	42.75	Pay estimated.

THOS. J. BRADY,
Second Assistant Postmaster-General.

C.—Steamboat service as in operation on the 30th of June, 1879.

Number of route.	State and termini.	Name of contractor.	Distance.	Total distance in each State.	Number of trips per week.	Annual pay.	Annual pay in each State.	Remarks.
	MAINE.		Miles.	Miles.		Dollars.	Dollars.	
250	{ Bath to Booth Bay	Eastern Steamboat Company..... Portland and Harpswell Steamboat Company. C. W. Howard..... Charles Deering..... do..... do.....	16	{		700 00		{ Twelve trips a week, July 5 to September 20; six trips a week during remainder of season of navigation.
294	{ Wiscasset to Booth Bay		20					
	Portland to Chebeague Island		11		6	299 00		
350	Green Vale to Indian Rock		10		6	500 00		
351	Boston, Mass., to Eastport, Me.		320		1	500 00		
352	Boston, Mass., to Machias Port, Me.		334		1	700 00		June 1 to September 30.
353	Rockland to Sullivan		78		1	300 00		
				759			2,699 00	
	NEW HAMPSHIRE.							
1101	Alton Bay to Meredith Village	W. M. Ashley..... Lake Winnepiscogee Steamboat Co.	10	{	6	2,000 00		During season of navigation. Do.
1232	Wair's Bridge to Wolfborough		25		3	660 00	2,650 00	
			30		6			
	MASSACHUSETTS.							
3127	Woods Holl to Nantucket	Nantucket and Cape Cod Steamboat Company.	30			7,875 00	7,875 00	Twelve trips a week for six months; six trips a week for six months.
	RHODE ISLAND.							
4101	Fall River, Mass., to New York, N. Y.	Old Colony Steamboat Company	184			10,000 00		Seven trips a week for three months; six trips a week for nine months.
4102	Newport to Wickford Landing	Newport and Wickford Railroad and Steamboat Company.	12	188	18	6,060 00	16,000 00	
	NEW YORK.							
6249	Plattsburgh to Burlington, Vt.	E. Smith..... Seneca Lake Steam Navigation Company. Champlain Transportation Company	23	{		939 00		Six trips a week for eight months.
6651	Geneva to Watkins		65		6	2,432 44		
6683	Lake George to Fort Ticonderoga		40			375 00		Six trips a week for three and two-thirds months.

C.—Steamboat service as in operation on the 30th of June, 1879—Continued.

Number of route.	State and termini.	Name of contractor.	Distance.	Total distance in each State.	Number of trips per week.	Annual pay.	Annual pay in each State.	Remarks.
	NEW YORK—Continued.		Miles.	Miles.		Dollars.	Dollars.	
6684	Harlem River to Jersey City, N. J.	New England Transfer Company	11½		7	1,800 00		
6687	Brooklyn to Jersey City, N. J.	Brooklyn Annex Company	3		30	1,825 00		
	PENNSYLVANIA.			142½			7,371 44	
8151	Pittsburgh to Greensborough	Adam Jacobs	88½	88½	6	5,500 00	5,500 00	
	MARYLAND.							
10097	Washington, D. C. to Glymont, Md	J. C. McKibbin	30		6	2,800 00		
10098	Baltimore to Benedict	Henry Williams	140		2	1,800 00		
10099	Baltimore to Freeport, Va.	Maryland Steamboat Company	200		2	1,800 00		
10100	Baltimore to Cambridge	do	98½		3	1,200 00		
10101	Baltimore to Wilson's Wharf	Eastern Shore Steamboat Company	{ 110 } { 40 }			4,200 00		{ Six trips a week, eight months. Two trips a week, four months. Two trips a week, eight months. One trip a week, four months.
10102	Baltimore to Queensdown	Chester River Steamboat Company	40	658½	3	750 00	12,550 00	
	VIRGINIA.							
11093	Potomac to Swan Wharf	Elwin Reeside	80½		2	5,440 00		
11095	West Point to Baltimore, Md	Baltimore, Chesapeake and Richmond Steamboat Company	200		3	1,800 00		
11099	Norfolk to Baltimore, Md	Baltimore Steam Packet Company	200		6	18,000 00		
11097	Norfolk to Eastville	Old Dominion Steamship Company	50		3	3,500 00		
11098	Norfolk to Mathews C. H.	do	86		3	3,000 00		
11099	Norfolk to Richmond	do	151		3	4,500 00		
11100	Fredericksburgh to Baltimore, Md	Henry Williams	290½	1,054	2	2,000 00	34,840 00	
11100	WEST VIRGINIA.		6		6	6,000 00		

No.	Port of Call	Company	Passenger	Freight	Gratuitous service.
12099	Parkersburg to Gallipolia, Ohio	Parkersburg and Ohio River Transportation Company.	87½	5,200 00	
12100	Kanawha C. H. to Gallipolia, Ohio	J. A. McClurg and J. R. Dudding	62	2,000 00	
			74½	15,800 00	
13066	Norfolk, Va., to Poplar Branch, N. C.	Zimri McDonald	75	1,353 00	
13067	Plymouth to Franklin, Va.	do	106	4,237 00	
13068	Plymouth to Windsor	do	30	999 00	
13069	Wilmington to Smithville	do	28	2,199 00	
13100	Wilmington to Fayetteville	W. H. Bagley	112	1,175 00	
			351	10,063 00	
14099	Charleston to Moultrieville	Zimri McDonald	7½	481 07	
14100	Charleston to Edisto Island	Peter Tuglio	43	800 00	
			56½	1,281 07	
15100	Rome to Gadsden, Ala.	J. M. Elliott	155	3,600 00	
			155	3,600 00	
16062	Fernandina to Brunswick, Ga.	Macon and Brunswick Railroad Company.	40		
16063	New Orleans, La., to Havana, Cuba.	John Miller	823		
16067	Jacksonville to Fort George	J. W. Fitzgerald	284	600 00	
16068	Milton to Warrington	Samuel Reebing	37	3,200 00	
16069	New York, N. Y., to Galveston, Tex.	C. H. Mulberry & Co.	2,036	10,400 00	
16090	Palatka to Crescent City	John F. Rhoads	30	1,000 00	
16091	Cedar Keys to Key West	New Orleans, Florida and Havana Steamship Company.	290	35,000 00	
			10	2,768 00	
16092	Fernandina to Trader's Hill, Ga.	H. L. Hart	884	1,839 00	
16093	Pensacola to Freeport	J. L. McKinnon	100	2,417 98	
16096	Palatka to Oklawaha	S. J. Bouknight	269		
16097	Jacksonville to Enterprise	Sherley & Hite	229½	16,979 30	
16098	Eufaula, Ala., to Apalachicola, Fla.	S. J. Whiteside	291	5,401 39	
16100	Cedar Keys to Tampa	James M. Kay	175	13,570 00	
			4,456½	93,275 57	

Gratuitous service.

Do.

Two trips a week for four months; one trip a week for eight months.
Six trips a week on 81 miles; three trips a week on 2 miles; six trips a week for six months; three trips a week for six months on 146½ miles.

C1—Steamboat service as in operation on the 30th of June, 1879—Continued.

Number of route.	State and terminal.	Name of contractor.	Distance. Miles.	Total distance in each State. Miles.	Number of trips per week.	Annual pay. Dollars.	Annual pay in each State. Dollars.	Remarks.
ALABAMA.								
17095	Gadsden to Olio.....	J. M. Elliott.....	30	.....	1	348 39	.....	Two trips a week for seven months and four days; one trip a week for four months and twenty-seven days. Seven trips a week for six months; three trips a week for six months.
17096	Chattanooga, Tenn., to Decatur, Ala.....	Capehart & Samuels.....	159	.....	1	2,860 00	.....
17097	Mobile to Demopolis.....	F. R. Stone.....	240	.....	2	5,200 00	.....
17098	Mobile to Selma.....	Owen Finnegan.....	310	.....	.....	1,833 36	.....
17099	Mobile to Point Clear.....	Edwin Baldwin.....	25	.....	.....	3,500 00	.....
MISSISSIPPI.								
18097	English Lookout, La., to Gainesville, Miss.....	Pollivent & Favre.....	16	764	3	775 50	.....
18098	Vicksburg to Falmouth.....	S. H. Parisot.....	246	.....	1	3,000 00	.....
18100	Vicksburg to Greenwood.....	.....do.....	266	522	2	4,800 00	.....
MISSISSIPPI.								
18098	Nashville to Paducah, Ky.....	T. G. Ryman.....	215	.....	.....	5,000 00	.....	Two trips a week for seven months; one trip a week for five months.
18098	Louisa to King's Creek.....	T. W. Fritts.....	47	.....	6	2,468 00	.....
18099	Chattanooga to King's Creek.....	Joseph Gleser.....	110	872	2	1,640 00	9,106 00	
KENTUCKY.								
20096	Louisville to Cincinnati, Ohio.....	United States Mail Line Company.....	143	.....	6	8,000 00	.....
20097	Louisville to Evansville, Ind.....	Sherley & Hile.....	293	.....	6	15,000 00	.....
20098	Evansville, Ind., to Cairo, Ill.....	Evansville, Cairo, and Memphis Packet Company.....	202	.....	4	15,000 00	.....

[illegible]

C.—Steamboat service as in operation on the 30th of June, 1879—Continued.

Number of route.	State and terminal.	Name of contractor.	Distance. Miles.	Total distance in each State. Miles.	Number of trips per week.	Annual pay. Dollars.	Annual pay in each State. Dollars.	Remarks.
LOUISIANA—Continued.								
30092	Lake Charles to Cameron	J. B. Price	48	.....	2	2,880 00	.....
30093	Donaldsonville to Saint Francisville ..	H. M. Norton	56	.....	6 }	8,712 12	.....
30094	Morgan City to New Iberia	J. W. Pharr	32	.....	2 }	5,900 00	.....
30095	New Orleans to Shreveport	J. A. Aiken	74	.....	6 }	30,000 00	.....
30096	New Orleans to Vicksburgh, Miss	Leathers, Tolbin & Cannon ..	680	.....	2	35,000 00	.....
30097	New Orleans to Hope Villa	M. B. Mancy	408	.....	3	2,300 00	.....
30098	New Orleans to Corvinton	C. M. Sorin	119	.....	2	3,800 00	.....
30099	New Orleans to Port Eads	Kenne, Scovell, O'Fry & Bassett ..	62	.....	2	6,944 00	.....
30100	New Orleans to Port Eads .....	.....	116	1,905	2	102,036 12	.....
TEXAS.								
31098	Galveston to Morgan City, La	C. A. Whitney & Co	225	.....	.....	44,400 00	.....	Three trips a week for six months; six trips a week for six months.
31100	Morgan City, La., to Brazos Santiago, Tex. ....	.....do	465	680	.....	4,800 00	49,200 00	Two trips a month.
WASHINGTON TERRITORY.								
43095	Port Townsend to Neah Bay	James Brittain	93	.....	1	3,380 00	.....
43096	Port Townsend to Sitka, Alaska	P. B. Cornwall	1,011	.....	1	14,800 00	.....
43097	Port Townsend to Semiahmoo	W. F. Munroe	132	.....	2 }	2,974 00	.....
43098	Seattle to Sehome	J. C. Brittain	115.25	.....	1 }	4,475 00	.....	One trip a month.
43099	New Tacoma to Port Townsend	L. M. Starr	89.75	1471.75	6	29,700 00	55,329 00	
OREGON.								
44099	Portland to Tillamook	Oregon Steam Navigation Company ..	120	.....	6	7,487 00	.....
44100	Portland to Astoria .....	.....	94	214	.....	4,960 00	12,477 00	

CALIFORNIA.

46095	Lakeport to Lower Lake.....	J. K. Frazer	22	3	900 00	.....
46096	{ San Francisco to Eureka..... }	Pacific Coast Steamship Company {	216	1	5,000 00	.....
46097	{ Branch, Eureka to Crescent City..... }		58	1	5,200 00	.....
46098	San Francisco to San Diego.....	do	482	1	2,400 00	.....
	Taloe to Taloe	A. Lyman and F. H. Fish.....	46.50	.....	8,000 00	.....
46099	San Francisco to Sacramento City.....	California Steam Navigation Com- pany	230	6	22,000 00	.....
46100	San Francisco to Portland, Oreg.....	Oregon Steamship Company	676	.....	43,500 00	.....
				1,740.50		

THOS. J. BRADY,

Second Assistant Postmaster-General.

C.—Steamboat service as in operation on the 30th of June, 1879—Continued.

Number of route.	State and termini.	Name of contractor.	Distance.	Total distance in each State.	Number of trips per week.	Annual pay.	Annual pay in each State.	Remarks.
			Miles.	Miles.		Dollars.	Dollars.	
LOUISIANA—Continued.								
30082	Lake Charles to Cameron	J. E. Price.....	48	2	2,880 00	Three trips a week for six months; six trips a week for six months. Two trips a month.
30083	Donaldsonville to Saint Francisville	H. M. Norton.....	56	.....	6	8,712 12	.....
30084	Morgan City to New Iberia	J. W. Pharr.....	74	.....	2	5,900 00	.....
30085	New Orleans to Shreveport	J. A. Aiken.....	660	.....	2	30,000 00	.....
30086	New Orleans to Vicksburgh, Miss	Leathers, Tobin & Cannon.....	408	.....	3	35,000 00	.....
30087	New Orleans to Hope Villa	M. B. Muncy.....	319	.....	1	2,300 00	.....
30088	New Orleans to Covington	C. M. Soria.....	62	.....	3	3,800 00	.....
30089	New Orleans to Port Eads	Konns, Scovell, O'Pry & Bassett.....	116	.....	8	6,944 00	.....
30100	New Orleans to Port Eads .....	.....	1,995	.....	102,036 12	.....	.....
TEXAS.								
31098	Galveston to Morgan City, La	C. A. Whitney & Co.....	225	.....	.....	44,400 00	.....
31100	Morgan City, La., to Brazos Santiago, Tex.	.....do.....	485	690	.....	4,800 00	49,200 00
WASHINGTON TERRITORY.								
43005	Port Townsend to Neah Bay	James Brittain.....	93	1	3,380 00	One trip a month.
43006	Port Townsend to Sitka, Alaska	P. E. Cornwall.....	1,011	.....	.....	14,800 00	.....
43007	Port Townsend to Bellingham	W. F. Monroe.....	132	.....	1	2,974 00	.....
43008	Seattle to Sehome	J. C. Brittain.....	115 25	.....	2	4,475 00	.....
43009	New Tacoma to Port Townsend	L. M. Starr.....	89 75	1471 75	6	29,700 00	55,329 00	
OREGON.								
44009	Portland to Tillamook	Oregon Steam Navigation Company.....	120	6	7,487 00	12,477 00
44100	Portland to Astoria .....	.....do.....	54	214	6	4,960 00	.....

CALIFORNIA.					
40953	Lakeport to Lower Lake.	J. K. Foster	32	3	000 00
	{ San Francisco to Eureka..... }		218	1	5,000 00
40958	Branch, Eureka to Crescent City..	Pacific Coast Steamship Company.	38		As often as steamers run.
40997	San Francisco to San Diego	" do "	482	1	5,200 00
40998	Tahoe to Tahoe	A. Lyman and F. H. Fish.	46.50		Six trips a week for six months; one trip a week for six months.
40999	San Francisco to Sacramento City ..	California Steam Navigation Com- pany	230	6	8,000 00
40100	San Francisco to Portland, Ore.	Oregon Steamship Company	676		Four trips a month.
			1,740.50		43,500 00

THOS. J. BRADY,
Second Assistant Postmaster-General.

D.—Table showing the increase and decrease in mail transportation and cost during the year ended June 30, 1879.

States and Territories.	CELEBRITY, CERTAINTY, AND SECURITY.				STEAMBOAT.				RAILROAD.				Total annual transportation.		Total annual cost.	
	Length of routes.		Cost.		Length of routes.		Cost.		Length of routes.		Cost.		Increase.	Decrease.	Increase.	Decrease.
	Miles.	Decrease.	Dollars.	Increase.	Miles.	Decrease.	Dollars.	Increase.	Miles.	Decrease.	Dollars.	Increase.				
Maine	184		2,082		30		650		27		2,806				2,511	744
New Hampshire	28		1,788						46		3,478				1,715	5,363
Vermont			1,783				4,375				11,703				1,844	5,363
Massachusetts			1,967						5		7,567				4,306	33,338
Rhode Island	10										40,917				8,944	8,947
Connecticut			3,281		44		2,172		149		7,430				2	71
New York	169		5,187						186		16,978					
Pennsylvania	58		8,329						245		7,342					
Delaware	9		2,243				4,600		1,156		1,156					
Maryland	27		2,671		170				7,728		11,751					
West Virginia	82		2,031						3,181		290,011				2,535	1,233
Virginia	262		4,421				1,160		3,181		290,011				1,828	
North Carolina	449		1,948						2,093		76,461				6,202	1,957
South Carolina	87		3,421						6,448		234,107					
Georgia	174		12,650		29				1,211		387,290				11,778	
Florida	573		6,336		2,828		7,082		5,407		189,438				5,639	
Alabama	503		15,351						8,808		135,248				6,507	
Mississippi	103		9,871								79,581				164,010	
Louisiana	75		151,304								1,681,314				21,978	3,101
Texas	1,792				76		1,834				13,284				11,591	
Arkansas	146		10,163		94		11,986		18		3,758				1,410	
Missouri	332		2,349		70		30,458		200		221,174					
Tennessee	365		7,868		125		5,000		244		107,262				29,002	
Kentucky	249				213				13		27,943				16,435	
Ohio	134		1,059						190		17,044				14,085	
Indiana	88		809						18		18,243					
Illinois	107		2,858		100				36		148,796				3,265	
Michigan	25		2,359								25,044				2,028	2,383
Wisconsin	120		2,743								156,648				2,917	
Minnesota	680										375,917				64,735	
Nebraska	161		1,460								726,303					
Kansas	709		14,076								10,492				24,567	

Nevada	316	3	2,971																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
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**THOS. J. BRADY,
Second Assistant Postmaster-General.**

E.—Table showing the weight of the mails, the speed with which they are conveyed, the amount on railroad-routes in States in which the contract-term expired June 30, 1879, and also in of the pay in accordance with the act of March 3, 1873; and used also in accordance with after July 1, 1876.

ABBREVIATIONS.—f. f., fixtures and furniture; f. f. c., fixtures and furniture complete; m. c., mail-line; t. l., triple line; q. l., quadruple line; l., line or lines; m., miles; r. a., route-agent; m. m., mail-in parentheses in the "Remarks" column refer to the order of the routes in this table.

Order.	State.	Number of route.	New number of route.	Termini.	Corporate title of company carrying the mail.	Length of route. Miles.	Miles per hour.
1	Ill	23031		East Saint Louis, Terre Haute.	Terre Haute and Indianapolis.	166.00	27
2	Mo	28001		Saint Louis, Atchison.	Missouri Pacific	339.75	25
3	Ill	23007		Chicago, Burlington	Chicago, Burlington and Quincy.	206.02	23
4	Ill	23015		Chicago, Davenport	Chicago, Rock Island and Pacific.	182.92	23
5	Ill	23008		Chicago, Union Pacific Transfer.	Chicago and Northwestern	461.18	22
6	Mass	3001		Boston, Portsmouth	Eastern	57.28	25
7	Wis	25002		Milwaukee, La Crosse	Chicago, Milwaukee and Saint Paul.	197.84	23
8	Me	9		Portland, Portsmouth	Eastern	52.56	23
9	Ill	23025		Chicago, Milwaukee	Chicago, Milwaukee and Saint Paul.	88.23	28
10	Mo	28010		Kansas City, Cameron	Hannibal and Saint Joseph	54	24
1	Ill	23001		Chicago, Milwaukee	Chicago and Northwestern	85.37	27
12	Wis	25009		Chicago, Green Bay	do	242.50	23
13	N. H	1001		Concord, Nashua	Concord	24.28	23
13a	Mich	24005	24006	Detroit, Chicago	Michigan Central	286.00	25
14	Ill	23020		Chicago, Cairo	Illinois Central	263.32	22
15	Ind	22010		Cincinnati, Saint Louis	Ohio and Mississippi	241	30
16	Iowa	27014		Davenport, Missouri River	Chicago, Rock Island and Pacific.	317.40	22
17	Ill	23023		Decatur, East Saint Louis	Wabash	112	28
18	Mass	3011		Boston, Salmon Falls	Boston and Maine	71.50	27

modations for mails and agents, the trips per week, and the rates of pay per mile per annum, other States and Territories, the returns having been obtained with a view to the readjustment the acts of July 12, 1876, and June 17, 1878, in the case of readjustments taking effect on and

catchers: r. p. o., railway post-office; apt., apartment; b. c., baggage-car; s. l., single line; d. l., double messengers. A number followed by an asterisk (*) shows the equivalent in round trips. The figures

Whole weight carried any distance for thirty days.			Average weight carried whole distance.		Size, &c., of mail car or apartment.	Trips per week.	Pay per mile per annum.	Remarks.	Order.
Outward	Inward	Total	30 days, total.	Per day, total.					
Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Feet and inches.		Dolls.		
186512	516387	702899	650395	21679	r. p. o., 60.9½ by 8.7½, f. f. c., d. l.; r. a. apt. 10.2 by 7, f. f., s. l.	23.7*	399 25	1.29 m. increase.....	1
510217	205028	715245	476135	15871	r. p. o., 50 by 9, f. f. c., d. l. to Kansas City, 282 m., s. l. res.	14.4*	323 67½	37 m., at \$274.94; 47.75 m., at \$283.67½.	2
541531	219635	761156	500290	16676	r. p. o., 54.6 by 8.6, 54.8 by 8.8, f. f. c., d. l., 35.1½ by 8.10½, f. f. c., s. l. between Chicago and Aurora, 38.61 m.; r. a. apt., 23.5 by 8.10, f. f. c., s. l. between Chicago and Aurora, 38.61 m.	22.6*	310 19	38.61 m., at \$332.09. Main route; branches, \$42.75, \$49.50 (289, 172); 1.13 m. increase.	3
400061	128460	584527	442853	14745	r. p. o., 50 by 9.6, 42 by 9.6, f. f. c., d. l.	15.29*	301 37	24 m., at \$326.37; .32 m. increase.	4
395717	204684	600651	369420	12314	r. p. o., 35 by 9.4, 1 l. 50 by 9.5, 1 l. 219 m.	12.49*	289 87	\$191.22½ for 272.60 m.; 1 m. increase.	5
220009	309046	538745	476432	15881	r. p. o., 42 by 8.7, f. f. c., d. l.; r. a. apt., 20 by 8.7, f. f., s. l.	24	276 31½	In May, 1879.....	6
320009	127632	448201	339734	11324	r. p. o., 50 by —, f. f. c., d. l. (40-foot cars authorized).	13	289 00	61.60 m., at \$190.79½; 16.80 m., at \$269; 25.76 m., at \$219; 2.80 m. increase.	7
270005	179657	456652	422685	14089	r. p. o., 42 by 8.7, f. f. c., d. l.; apt., 20 by 8.7, f. f., s. l. over 10 m. of route.	24	251 78	In May, 1879.....	8
348743	146823	495566	479359	15978	r. p. o., 50 by —, f. f. c., d. l. (40-foot cars authorized).	17.7*	250 00	.....	9
48189	70844	119033	108142	3604	r. p. o., 40.1½ by 9.1½, f. f. c., s. l.	13	239 00	\$730 for ferrisage	10
95683	80824	176007	138500	4618	r. p. o., 35.4 by 9.2, f. f., d. l.	12	232 00	.52 m. decrease	11
143184	87238	230522	83457	2781	r. p. o., 50 by 10, f. f. c.; s. l.	13.13*	230 00	66.50 m., at \$166.96; .70 m. decrease.	12
.....	.....	.....	332773	5546	r. p. o., 41.9 by 8.7, 42.5 by 8.9, 23.9 by 6.6, 21.7 by 6.9 (av. 32.4 by 7.8); f. f., d. l.; r. a. apt., 16.9 by 6.8, 12 by 7; f. f.; d. l. to Manchester, 18 m.	34.5*	229 65	Combined weights 60 days in Apr., 1877, and Aug., 1878.	13
235032	190527	425559	185825	6194	r. p. o., 44 by 9.2, f. f. c., s. l.; r. a. apt., (av.) 11.5 by 8, f. f., t. l. to Wayne Junction, 18 m., d. l. thence to Jackson, 57.7 m., s. l. between Niles and Chicago, 94 m.	16.55*	223 00	1.67 m. increase	a13
381223	324304	705527	169755	5658	r. p. o., 44.4 by 9, 41.5 by 9.2½, 49.4 by 9, 49.4 by 9, f. f. c.; q. l. to Kankakee, 55.87 m., d. l. thence to Tolono, 81.17 m., s. l. res.	15.9*	219 70	226.61 m., at \$144.70; .87 m. decrease.	14
160509	86282	246851	146638	4887	r. p. o., 49.6 by 9.3, 44.6 by 9.3, f. f. c., s. l. (av. 47 by 9.3).	13	206 00	In Nov. and Dec., 1878.	15
385831	126444	512275	361022	12034	r. p. o., 50 by 9.6, 42 by 9.6, f. f. c., d. l. to Iowa City, 54.50 m., s. l. res.	12	192 50	54 m., at \$217.58; .60 m. decrease.	16
91816	51943	143759	127816	4260	20 by 9.4, f. f., s. l.	15	187 00	.....	17
154280	110662	260942	137962	4598	r. p. o., 25 by 8.6, f. f. c., d. l.; r. a. apt., 14.4½ by 6.10, av. f. f., s. l. between Boston and Lawrence.	24	185 61	Main route; branch, \$42.75. In May, 1879.	18

E.—Table showing the weight of the mails, the speed with which they

Order.	State.	Number of route.	New number of route.	Termini.	Corporate title of company carrying the mail.	Length of route.	Miles per hour.
19	Ill....	23017		Chicago, East Saint Louis ..	Chicago and Alton	<i>Miles.</i> 282.28	25
20	Iowa ..	27005		Burlington, Council Bluffs ..	Chicago, Burlington and Quincy.	292.14	23
21	Minn..	26013		Minneapolis, La Crosse	Chicago, Milwaukee and Saint Paul.	146.54	22
22	Ill....	22028		Terre Haute, East Saint Louis.	Indianapolis and Saint Louis..	188.99	27 av.
23	Mo....	28011		Sedalia, Denison	Missouri, Kansas and Texas ..	447.42	21
24	Mo....	26005		Quincy, Saint Joseph	Hannibal and Saint Joseph...	203.5	24
25	Wis....	25012	25014	Winona, Winona Junction..	La Crosse, Trempealeau and Prescott.	30.83	20
26	Ill....	28010		Galesburg, Quincy	Chicago, Burlington and Quincy.	101.57	25
27	Me....	11		Salmon Falls, Portland	Boston and Maine	45	25
28	Me....	12		Bangor, Vanceborough	European and North American	113.93	19
29	Mo....	28014		Hannibal, Sedalia	Missouri, Kansas and Texas ..	142.88	21
30	Mo....	28006		Kansas City, Union Pacific Transfer.	Kansas City, Saint Joseph and Council Bluffs.	203.5	22.5
31	La	30001		New Orleans, Canton	New Orleans, Saint Louis and Chicago.	206.10	25
32	Colo....	33007		Denver, Cheyenne	Denver Pacific Railway and Telegraph Company.	106	23
33	Mass..	3063		Lawrence, Manchester	Manchester and Lawrence	37.06	24
34	Mo....	28004		Saint Louis, Kansas City ...	Saint Louis, Kansas City and Northern.	278.10	21.5
35	N. Y ..	6036		Rome, Ogdensburgh	Rome, Watertown and Ogdensburgh.	142	25
36	Wis....	25010		Caledonia Station, Winona Junction.	Chicago and Northwestern....	190.02	19
37	Ill....	23025		Hannibal, Naples	Wabash	45.50	25
38	Ill....	23009		Peoria, Galesburg	Chicago, Burlington and Quincy.	54.85	27
39	N. H ..	1005		Concord, Wells River	Boston, Concord and Montreal.	94.01	23
40	Wis....	25001		Milwaukee, North McGregor	Chicago, Milwaukee and Saint Paul.	197.14	22
41	Mo....	28022		Roadhouse, Mexico	Chicago and Alton	90	26
42	Cal....	40003		Roseville, Redding	Central Pacific	151.45	20
43	Tex....	31003		Houston, Denison City	Houston and Texas Central...	237.45	20
44	Ill....	23030		East Saint Louis, Duquoin ..	Saint Louis, Alton and Terre Haute.	71.27	24 av.
45	Ill....	23018		Bloomington, East Saint Louis.	Chicago and Alton	180.80	26
46	Ill....	23021		Dubuque, Centralia	Illinois Central	346.93	18

are conveyed, the accommodations for mails and agents, &c.—Continued.

Whole weight carried any distance for thirty days.			Average weight carried whole distance.		Size, &c., of mail-car or apartment.	Trips per week.	Pay per mile per annum.	Remarks.	Order.
Outward.	Inward.	Total.	30 days, total.	Per day, total.					
Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Feet and inches.		Dolls.		
123547	95008	218555	96358	3212	r. p. o., 44.4 by 8.1, f. f. c., s. l. r. p. o., 25.7 by 8.10, f. f. c., s. l. between Pontiac and Bloomington, 34.8 m.	16.17	185 61		19
238526	107300	345910	247232	8241	r. p. o., 51 by 8.8, f. f. c., s. l.	12	183 64	Main route; branches, \$34.20, \$46.51 (346, 184).	20
86330	170090	256420	150909	5330	r. p. o., 40 by —, f. f. c., s. l.	12.0	180 61	0.4 m., at \$63.61; 8.85 m. at \$79.51; 103.84 m., at \$178; 1.30 m. decrease.	21
35808	32871	68739	27965	992	r. p. o., 40 by 9.10, f. f. c., s. l.	15	178 00	.99 m. increase	22
197207	86319	283616	150971	5032	r. p. o., 50.4 by 9, f. f. c., s. l. r. a. apt., 16.8 by 9.2, f. f. c., s. l.	12.37	172 91½	23.50 m., at \$143.33	23
231836	94247	326083	174197	5806	r. p. o., 40½ by 9.1½, f. f. c., s. l. to Cameron, 171 m.	13	172 06	Main route; branch, \$34.20 (347), 32½ m., at \$147.06.	24
16877	38696	55573	51110	1703	15.3 by 7.6, f. f. c., s. l.	12	170 00	.38 m. increase	25
139553	56675	196228	162958	5431	r. p. o., 44.4 by 9.1½, f. f. c., d. l.	12	169 49½	1.57 m. increase	26
51906	38185	90093	79385	2646	r. p. o., 25 by 8.6, f. f. c., d. l.	15	165 09	In May, 1879	27
93372	60564	153936	110021	3687	r. p. o., 21 by 9.6, f. f. c., s. l.	12	158 30	In May, 1878	28
71238	49029	120267	85218	2840	r. p. o., 50.4 by 9, f. f. c., s. l.	12	150 68½		29
137495	67467	204962	107230	3574	39.1½ by 9.1½, f. f. c., s. l.	13.48	141 07½		30
49125	86500	135625	86101	2870	25 by 9, f. f. c., s. l.	7	140 40	2.10 m. increase. In Apr., 1878.	31
14033	10281	24314	18385	612	12 by 7, f. f. c., s. l.	7	137 70	In July, 1878. Formerly part of r. 33001.	32
			111853	1860	16.9 by 6.8, 12 by 7, f. f. c., d. l.	18	133 30	In Aug., 1878. Combined with returns 1877.	33
102816	55633	158449	64458	2148	25.5½ by 7.7½, f. f. c., d. l.	26	132 52½	1.54 m. increase	34
66804	53469	120073	59465	1982	25 by 7.4, f. f. c., s. l.	18	132 52½	Main route; branch, \$52.20 (130). In Mar., 1879.	35
67970	45916	113886	36536	1217	36 by 9.6, f. f. c., s. l.	12	132 00	54.90 m., at \$70; .83 m. decrease.	36
18123	33848	51971	40906	1363	12 by 9.10, f. f. c., s. l.	12	131 00	Main route; branch, \$50 (156).	37
22914	41573	63487	44367	1478	15.11 by 8.9½, f. f. c., s. l. to Elmwood, 28.59 m., d. l. res., 26.26 m.	14.9	128 25	.85 m. increase	38
			111539	1838	16.9 by 6.8, f. f. c., d. l. to Plymouth, 51 m., s. l. res.	18	127 90	In Aug., 1878. Combined with returns Apr., 1877. 43.01 m., at \$117.90.	39
68212	45567	113779	63236	2107	19.6 by 9.2, f. f. c., s. l.	13.9	125 00	.06 m. decrease	40
47429	24825	72254	40155	1838	r. p. o., 25.7 by 8.10, f. f. c., s. l.; r. a. apt., 19.6 by 9.2, f. f. c., s. l.	13	123 87½		41
60200	21234	81534	57536	1917	23.6 by 8.10½, f. f. c., s. l.	7½	121 50	In Aug., 1878	42
			127205	2120	14 by 7.3, f. f. c., s. l.	13	120 55	Combined weighings in Apr. and Dec., 1878.	43
49526	22191	71717	54741	1824	18 by 7.6, f. f. c., s. l.	15.4	119 00	.53 m. decrease	44
53574	93604	147178	32773	1092	r. p. o., 25.7 by 8.10, f. f. c., s. l. to Roadhouse, 110 m.; r. a. apt., 19.6 by 9.2, f. f. c., s. l. res.	14.32	113 16½	69.40 m. at \$66.61	45
112497	175868	289355	56776	1892	r. p. o., 35.4½ by 8.10½, 35.8 by 9.5, f. f. c., d. l. to Freeport, 68.80 m.; s. l. thence to Foreston, 12.51 m.; r. a. apt., 27.3 by 9, f. f. c., s. l. between Freeport and Centralia, 278.13 m.	12	107 38½	67.67 m. at \$146.88; 12.53 m. at \$129.8; 2.93 m. increase.	46

E.—Table showing the weight of the mails, the speed with which they

Order.	State.	Number of route.	New number of route.	Termini.	Corporate title of company carrying the mail.	Length of route. Miles.	Miles per hour.
47	Ill	23041		Quincy, Hannibal	Chicago, Burlington and Quincy	19. 09	20
48	Mich.	24007	24028	Detroit, Port Huron	Grand Trunk, of Canada	64. 85	12
49	Mich.	24006	24027	Detroit, Grand Haven	Detroit, Grand Haven and Milwaukee	191. 15	15
50	Kans.	33008	33006	Kansas City, Ottawa	Kansas City, Lawrence and Southern (late Leavenworth, Lawrence and Galveston).	48. 03	15
51	Minn.	26009		Mendota, McGregor	Chicago, Milwaukee and Saint Paul.	207. 96	12.5
52	Tex.	31002		Harrisburg, San Antonio	Galveston, Harrisburg and San Antonio.	215	24.7
53	Oreg.	44001		Portland, Roseburg	Oregon and California	199. 10	14
54	Mich.	24035		Toledo, Detroit	Toledo, Canada Southern and Detroit.	61. 32	13
55	Kans.	33005	33008	Kansas City, Baxter Springs	Missouri River, Fort Scott and Gulf.	154. 79	25
56	Iowa	27029		Missouri Valley, Sioux City	Sioux City and Pacific	76. 18	22
57	Mich.	24010		Jackson, Grand Rapids	Michigan Central	94. 46	21
58	Iowa	27021		Dubuque, Sioux City	Illinois Central	329. 61	21
59	Ill	23016		Bureau Junction, Peoria	Chicago, Rock Island and Pacific.	47. 16	12
60	Mich.	24013		Detroit, Bay City	Detroit and Bay City	108. 62	19
61	Mich.	24021		New Buffalo, Pentwater	Chicago and West Michigan	170. 20	17
62	N. H.	1006		Groveton, Wells River	Boston, Concord and Montreal	54. 12	26
63	Mo.	28063		Saint Louis, Vinita	Saint Louis and San Francisco	364. 25	20
64	Mich.	24017		Detroit, Howard City	Detroit, Lansing and Northern	160. 72	21
65	Mich.	24004		White Pigeon, Grand Rapids	Lake Shore and Michigan Southern.	95. 67	24
66	Iowa	27019		Keokuk, Des Moines	Keokuk and Des Moines	162. 88	21
67	Ohio	21051		Columbus, Portsmouth	Scioto Valley	102. 10	22
68	Mo.	28018		Keokuk, Clarksville	Saint Louis, Keokuk and Northwestern.	96. 20	20
69	Wis.	25018		Milwaukee, Two Rivers	Milwaukee, Lake Shore and Western.	85	17
70	Wis.	25011		Kenosha, Rockford	Chicago and Northwestern	72. 50	17
71	Iowa	27022		Waterloo, Mona	Illinois Central	79. 79	15
72	Iowa	27017		Wilton Junction, Leavenworth.	Chicago, Rock Island and Pacific.	322. 90	24
73	Iowa	27001		Burlington, Albert Lea	Burlington, Cedar Rapids and Northern.	353. 47	21
74	Ohio	21004		Hudson, Columbus	Cleveland, Mount Vernon and Delaware.	145. 88	28
75	Ill	23041		Fall Creek, Louisiana	Chicago, Burlington and Quincy.	31. 92	15
76	Minn.	26005	26025	Saint Paul, Saint James	Saint Paul and Sioux City	122. 53	22
77	Cal.	46028		San Francisco, Tracy Junction.	Central Pacific	71. 73	16
78	Tex.	31005		Bremont, Waco	Houston and Texas Central.	44. 09	20
79	Ill	23027		State Line, Warsaw	Toledo, Peoria and Warsaw	230. 21	24
80	Minn.	26006	26021	White Bear Lake, Albert Lea	Minneapolis and Saint Louis	123. 54	22
81	Mo.	28007		Moberly, Ottumwa	Saint Louis, Kansas City and Northern.	130. 81	17.5

are conveyed, the accommodations for mails and agents, &c.—Continued.

Whole weight carried any distance for thirty days.			Average weight carried whole distance.		Size, &c., of mail-car or apartment.	Trips per week.	Pay per mile per annum.	Remarks.	Order.
Outward.	Inward.	Total.	30 days, total.	Per day, total.					
Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Feet and inches.		Dolls.		
20383	9112	29495	25722	857	11.3 by 7.4, f. f., a. l.	18	106 87½	Main route; branch, \$72.67½ (75); 29 m. increase.	47
40211	28548	68759	58980	1966	24 by 6, f. f., a. l.	15.5*	105 30	.35 m. increase	48
78839	46442	125281	57220	1907	22 by 9.2 (av.), f. f., a. l.	20.2*	98 32½	1.48 m. increase	49
26804	13116	40010	37075	1235	18 by 8.9, f. f., a. l.	6	96 30	In April, 1878	50
53286	53564	106852	35464	1182	23.6 by 9.2, f. f., a. l.	10.08*	95 00	95.50 m. at \$64.98; .74 m. decrease.	51
			86141	1436	11.5 by 8.3 (av.), f. f., a. l.	12	94 91	Combined weights for April, 1878, and March, 1879.	52
32625	37583	70208	39681	1322	20 by 9, f. f., a. l.	6	94 91	In August, 1878	53
129321	94920	224241	133869	4462	16 by 9.3, f. f., a. l. to Slocum Junction, 44 m.; d. l. res., 17.32.	18.6*	92 00	17.32 m. at \$102; 4.93 m. increase.	54
41633	28023	69656	35874	1195	18 by 8.9, f. f. c., a. l.	10½*	90 72	5.41 m. decrease. In April, 1878.	55
39992	19739	59731	48312	1610	17.4 by 9, f. f., a. l.	12	90 63	Main route; branch, \$42.75 (235); 18 m. increase.	56
29644	20643	50287	35732	1191	11 by 7, 10.10 by 8.8, f. f., a. l.	19	90 00	.40 m. decrease	57
106745	54443	161188	54814	1820	21.5 by 8.11 (av.), f. f., a. l.	12	85 50	2.49 m. increase	58
24773	15628	40399	34529	1150	20 by 9.6, f. f., a. l.	12	85 50	.16 m. increase	59
36340	19522	55862	39025	1300	14.4 by 9, f. f., a. l.	18	85 00	.35 m. decrease	60
64894	27802	92696	23229	774	12.2 by 8.5 (av.), f. f., a. l.	12.6*	82 00	Main route; branch, \$68 (87); .36 m. decrease.	61
			55848	930	16.9 by 6.8, 13.6 by 6.7, 9.11 by 6.9, f. f., a. l. to Wing Road, 26 m.; d. l. res., 28.12 m.	15½*	81 00	In August, 1878. Combined with returns for 1877.	62
63401	38710	102111	44512	1483	21.11 by 7.3, f. f., a. l.	8.4*	78 66	37 m. at \$66.46.31	63
37296	30783	68079	31552	1051	12 by 9.3, 13 by 9.3, f. f., a. l.	8.3*	78 00	3.95 m. decrease	64
33451	18496	51947	28006	933	16 by 9, f. f., a. l.	12	76 95		65
27939	25318	53257	18800	636	14 by 9 (av.), f. f., a. l.	12	76 00	.07 m. increase	66
29682	17301	47183	22298	743	9.11 by 6.8½ (av.), a. l.	13.4*	75 24	In July, 1879	67
18912	31347	50260	21094	703	19 by 8.6, f. f., a. l.	13	75 00	26.08 m. at \$64.12; 9.40 m. from February 1, 1877.	68
17393	11266	28649	17367	578	11 by 7.11, f. f., a. l.	12	75 00	Main route; branches, \$45, \$51.30 (193).	69
41332	21734	63066	14464	482	12.6 by 7.2½, f. f., a. l.	7.8*	75 00	1.10 m. decrease	70
20013	11695	31708	16446	548	16.6 by 8.10 (av.), f. f., a. l.	12	73 00	.30 m. decrease	71
61722	46527	108249	33042	1101	17.1 by 9.6 (av.), f. f., a. l. to Edgerton Junction, 301.40 m.; res. no r. a.	12.3*	72 87½	.13 m. increase	72
52943	34227	87170	25115	837	20 by 9.4, f. f., a. l.	12	72 87½	33.93 m. from January 10, 1878.	73
28524	32518	61042	24274	809	15 by 7, f. f., a. l.	12	72 67½	In October, 1878	74
6176	5600	12076	9495	316	11.3 by 7.4, f. f., a. l.	6	72 67½	Branch; main route, \$106.87½ (47); 1.07 m. increase.	75
39662	26058	64720	40965	1365	22.6 by 9.4, f. f., a. l.	12	72 50½	.11 m. decrease	76
17038	18791	35829	20646	688	10 by 8.9, f. f., a. l.	7	71 82	In February, 1879	77
			37914	632	14 by 7.3, f. f., a. l.	6	70 11	Combined weightings in April and December, 1878.	78
41239	53670	94909	29183	972	18.8 by 8.4 (av.), f. f., a. l.	16.4*	70 00	\$600 per annum for ferrriage. Main route; branch, \$42.75 (269); 1.46 m. increase.	79
19627	17625	37252	18573	619	22.1 by 9.4, f. f., a. l. between Minneapolis and Albert Lea, 108 m.	8.65*	69 25	.19 m. increase at \$50.	80
36244	26050	62294	33836	1127	25.5½ by 7.7½, f. f., a. l.	7	68.40	19 m. decrease	81

E.—Table showing the weight of the mails, the speed with which they

Order.	State.	Number of route.	New number of route.	Termini.	Corporate title of company, carrying the mail.	Length of route.	Miles per hour.
						<i>Miles.</i>	
82	Wis.	25024		Racine, Rock Island	Western Union	196.40	18½
83	Wis.	25003		Milwaukee, Berlin	Chicago, Milwaukee and Saint Paul	97.54	12
84	Mich.	24002		Monroe, Adrian	Lake Shore and Michigan Southern	34.82	24
85	IW	25013	25012	Milwaukee, Fond du Lac	Chicago and Northwestern	63.53	13
86	ow	27012		Clinton, La Crescent	Chicago, Clinton, Dubuque and Minnesota	181.24	16
87	Mich.	24021		Holland, Grand Rapids	Chicago and West Michigan	25.9	19
88	Pa.	8003		Philadelphia, West Chester	West Chester and Philadelphia	26.35	18
89	Tex.	31004		Hempstead, Austin	Houston and Texas Central	115.20	20
90	Minn.	26020	26005	Breckenridge, Saint Vincent	Saint Paul, Minneapolis and Manitoba	202.91	13½
91	Iowa	27011		Burlington, Keokuk	Chicago, Burlington and Quincy	43.69	12
92	Mo.	28020		Pierce City, Oswego	Missouri and Western	72.76	20
93	Mo.	28032		Atchison, Edgerton Junction	Chicago, Rock Island and Pacific	30	14½
94	S. C.	14003		Branchville, Charleston	South Carolina	62.25	20
95	N. Y.	6061		Brocton, Corry	Buffalo, Chautauqua Lake and Pittsburg	44.8	17
96	Ill.	23042		Chicago, Danville	Chicago and Eastern Illinois	129	21½
97	Ill.	23037		Vincennes, Cairo	Cairo and Vincennes	156	24
98	Pa.	8027		Lancaster, Middletown	Pennsylvania	31.5	av. 19
99	W. Va.	12005		Stenbenville, Wheeling	Pittsburg, Cincinnati and Saint Louis	26.13	20
100	Minn.	26007		Saint Paul, Duluth	Saint Paul and Duluth	155.73	16
101	Colo.	38004	38003	Denver, Cheyenne	Colorado Central	125.62	15
102	Wis.	25014	25030	Elroy, Saint Paul	Chicago, Saint Paul and Minneapolis	106.4	20
103	Mich.	24015		East Saginaw, Bay City	Flint and Pere Marquette	12.75	20
104	Mich.	24009		Jackson, Gaylord	Michigan Central	224.94	19
105	Ill.	23005		Sterling, East Saint Louis	Chicago, Burlington and Quincy	301.12	20
106	N. Y.	6072		Lyons, Sayre	Geneva, Ithaca and Sayre	92.62	24
107	S. C.	14003		Kingsville, Augusta	South Carolina	118	24
108	S. C.	14003		Kingsville, Columbia	South Carolina	25.7	24
109	Mo.	28028		Saint Joseph, Hopkins	Kansas City, Saint Joseph and Council Bluffs	61.5	22½
110	Ill.	23033		Beardstown, Shawneetown	Ohio and Mississippi	229.79	19
111	N. H.	1002		Concord, Portsmouth	Concord	59.16	15

are conveyed, the accommodations for mails and agents, &c.—Continued.

Whole weight carried any distance for thirty days.			Average weight carried whole distance.		Size, &c., of mail-car or apartment.	Trips per week.	Pay per mile per annum.	Remarks.	Order.
Outward.	Inward.	Total.	30 days total.	Per day total.					
Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Feet and inches.		Dolla.		
43869	46044	89913	28914	963	16.2 by 9.3, f. f., s. l.	12	68 40	Main route; branch, \$50 (169).	82
26013	16125	42138	23503	783	18.9 by 9.2, f. f., d. l. to Rip-on, 81.89 m.; s. l. res.	12	68 40	2.74 m. increase	83
13884	7, 912	21796	19484	649	13 by 9, f. f., s. l.	12	68 40	.41 m. decrease	84
38872	27288	66160	58925	1960	12.6 by 7.6, f. f., s. l.	12	68 00		85
36855	24925	61780	20061	668	18.4 by 8.10, f. f., s. l.	8 9	68 00	1.47 m. increase	86
13825	7162	20987	18124	604	12.11 by 9.3 (av.), f. f., s. l.	6	68 00	Branch; main route, \$82 (61); .75 m. decrease.	87
19216	15439	34655	22827	760	8 by 5.7 by 7, f. f., s. l.	24	67 54½	In September, 1878.	88
			35265	588	14 by 7.3, f. f., s. l.	6	67 54	Combined weighings in April and December, 1878.	89
29460	9962	39422	26190	873	No apt., no r. a.	6	66 96	Main route; branch, \$34.20 (352); .66 m. increase.	90
16761	8402	25163	18794	626	19.6 by 8.9, f. f., s. l.	12	66 69	.94 m. increase	91
20397	22859	43256	24780	826	11.3 (av.) by 6.10, f. f., s. l.	7	65 83½	Main route; branch, \$45 (198). Title reported Saint Louis and San Francisco.	92
6857	6322	13179	11375	379	16 by 9.6, f. f., s. l.	7	65		93
15212	22785	37997	34474	1149	16.6 by 8.4, f. f., d. l.	25	64 98	Branch; main route, \$59.85 (107). In Apr., 1879.	94
13127	13533	26660	15721	524	10 by 6, f. f., s. l.	12	64 98	In July, 1879. In name of W. E. Lewis, owner of Chautauqua Lake Railroad, from Aug. 22, 1878, to Feb. 11, 1879.	95
22709	14729	37438	22463	748	16.9½ by 6.9 (av.), f. f., s. l.	12	64 12½	Main route; branch, \$34.20 (351); .75 m. decrease.	96
20219	17106	37325	17116	570	11.9 by 6.9, f. f., s. l.	6	64 12½		97
44493	31814	76307	32862	547	10.11 by 8.7, f. f., s. l.	19 12*	62 10	60 days in Mar. and Apr., 1878.	98
9872	5959	15831	13138	437	in b. c.	12	62 10	In Nov., 1878.	99
17303	9508	26811	11242	374	22 by 8.6, f. f., s. l.	6*	60 87½		100
23508	21157	44665	19152	638	16 by 8, f. f., s. l.	7	60 71	Main route; brches, \$55.58, \$45.32 (190, —). In July, 1878.	101
42389	34598	76987	33953	1131	24 by 9, f. f., s. l.	12 40*	60 19½	.60 m. decrease	102
9342	9263	18605	17573	585	15 by 9, f. f., s. l.	21*	60 00	Branch; main route, \$96, \$66.66½.	103
42935	28642	71577	15733	524	11.7 by 8.10 (av.), f. f., s. l.	37 21*	60 00	1.42 m. increase	104
35288	59218	94506	30414	1013	11.8 by 9.3, 12 by 7.2, f. f., s. l.	10 9*	59 85	9.76 m. increase	105
18711	17418	36129	19480	649	12 by 7, f. f., s. l.	12 02*	59 85	37 m. at \$60.70½; 15.62 m. from Jan. 20, 1879. In May, 1879.	106
22433	23358	45791	17519	583	16.6 by 8.4, f. f., s. l.	12 62*	59 85	Main route; brches, \$64.98, \$59.85, \$38.47½ (94, 106, 338). In Apr., 1879.	107
6370	9687	18257	17328	577	16.6 by 8.4, f. f., s. l.	13	59 85	Branch; main route, \$59.85 (107). In Apr., 1879.	108
16743	18144	34917	16702	556	13.4 by 7.5, f. f., s. l.	13	59 85		109
26061	25081	51162	11336	377	12.7 by 8.1 (av.), f. f., s. l.	8 46*	59 85		110
			24117	402	13.6 by 6.7, f. f., s. l.	12	58 50	In Aug., 1878. Combined with returns for 1877.	111

E.—Table showing the weight of the mails, the speed with which they

Order.	State.	Number of route.	New number of route.	Termini.	Corporate title of company carrying the mail.	Length of route.	Miles per hour.
112	N. Y.	6102		Rochester, Salamanca	Rochester and State Line	^{Miles.} 108.92	23
113	Wis.	23016		Milwaukee, Green Bay	Wisconsin Central	114.53	27
114	Mich.	24008	24029	Jackson, Fort Wayne	Fort Wayne, Jackson and Saginaw	97.24	19
115	Mo.	28019		Quincy, Norwinger	Quincy, Missouri and Pacific	79.28	20
116	Wis.	25004		Milton Junction, Monroe	Chicago, Milwaukee and Saint Paul	42.62	21
117	Iowa	27010		Ottumwa, Mason City	Central, of Iowa	172.66	20
118	Mich.	24003		Adrian, Jackson	Lake Shore and Michigan Southern	47.24	23
119	Iowa	27007		Creston, Hopkins	Burlington and Missouri River	44.40	23
120	Ill.	23008		Elmwood, Buda	Chicago, Burlington and Quincy	47.80	12
121	Iowa	27026		Conover, Decorah	Chicago, Milwaukee and Saint Paul	9.50	13
122	Minn.	26018	26026	Saint James, Sioux City	Sioux City and Saint Paul	148.44	12
123	Ill.	23052		Cortland Station, Sycamore	Sycamore and Cortland	5.26	29
124	Cal.	46029		Niles, San José	Central Pacific	18.07	29
125	Nebr.	34010		Fremont, Wisner	Sioux City and Pacific	51.47	17
126	Ill.	23040		Peoria, Rock Island	Rock Island and Peoria	91.68	24
127	Mich.	24018		Fort Wayne, Walton	Grand Rapids and Indiana	262.03	19
128	N. Y.	6074		Ithaca, De Ruyter	Utica, Ithaca and Elmira	43	27
129	Ill.	23011		Burlington, Quincy	Chicago, Burlington and Quincy	73.65	19
130	N. Y.	6036		De Kalb Junction, Norwood	Rome, Watertown and Ogdensburgh	25	25
131	Mich.	24025	24008	Jackson, Niles	Michigan Central	103.33	22
132	Iowa	27020		Farley, Cedar Rapids	Dubuque and Southwestern	57.98	19
133	Wis.	25015	25027	Green Bay, Winona	Green Bay and Minnesota	214.81	24
134	Wis.	25016		Hilbert, Menasha	Wisconsin Central	16.16	26
135	Ill.	23012		Streator, Aurora	Chicago, Burlington and Quincy	61.84	24
136	Ill.	23038		Peoria, Jacksonville	Peoria, Pekin and Jacksonville	84.24	20
137	Ill.	23012		Aurora, Batavia	Chicago, Burlington and Quincy	10.15	15
138	Ill.	23047		Chester, Tamara	Wabash, Chester and Western	41.75	14
139	Minn.	26012		Austin, Mason City	Chicago, Milwaukee and Saint Paul	41.47	21
140	Mo.	28015		Keokuk, Centerville	Missouri, Iowa and Nebraska	91.42	20
141	Iowa	27030		Des Moines, Callanan	Des Moines and Minneapolis	57.92	15
142	Iowa	27030		Des Moines, Callanan	Des Moines and Minnesota	57.92	15
143	Mich.	24033	24016	Ionia, Blanchard	Detroit, Lansing and Northern	41.94	16
144	Wis.	25006		Horicon, Portage	Chicago, Milwaukee and Saint Paul	45.64	21
145	Mich.	24036		Grosse Ile, Fayette	Chicago and Canada Southern	70.3	15
146	Iowa	27028		Savannah, Marion	Chicago, Milwaukee and Saint Paul	89.66	22
147	Ill.	23048		Terre Haute, Peoria	Illinois Midland	177.91	20
148	N. H.	1007		Wing Road, Fabyan House	Boston, Concord and Montreal	12.56	15

are conveyed, the accommodations for mails and agents, &c.—Continued.

Whole weight carried any distance for thirty days.			Average weight carried whole distance.		Size, &c., of mail-car or apartment.	Trips per week.	Pay per mile per annum.	Remarks.	Order.
Outward.	Inward.	Total.	30 days, total.	Per day, total.					
Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Feet and inches.		Dolls.		
14504	10727	25321	11404	380	14.2 by 7.2, f. f., a. l.	12	58 50	54.04 m. from Aug. 1, 1878. In Apr., 1879.	112
43113	20821	63934	30738	1324	7.7 by 6.10, f. f., a. l. to Hilbert, 86.1 m.; no r. a. residue.	12	58 14	Main route; branch, \$51.30 (134); 2.99 m. increase.	113
15408	13084	28392	10723	357	10.6 by 7.6, f. f., a. l.	9.09*	58 14	.42 m. increase	114
11828	8714	20542	11450	381	11.2 by 7.2, f. f., a. l.	12	58 00	8 m. from Feb., 1879.	115
8844	5255	14099	8272	275	13.4 by 7.8, f. f., a. l.	8.2*	58 00	.18 m. decrease.	116
33529	28905	62434	25641	854	22 by 9.6, f. f., a. l.	12	56 43	Main route; branch, \$42.75 (313). Title reported "Central Iowa Railway."	117
12365	11815	24180	16005	555	12 by 8.4, f. f., a. l.	11.5*	55 57½	.01 m. decrease.	118
12500	9860	22420	16122	537	15.3 by 7.4, f. f., a. l.	9*	55 57½		119
6434	9403	15837	8822	294	13.6 by 6.7, f. f., a. l.	7.7*	55 57½	Branch; main route, \$48.73½ (175); 2.80 m. increase.	120
5115	5192	10307	10307	343	in b. c.; no r. a.	12	55 60		121
27192	26103	53295	33214	1107	22.6 by 9.4, f. f., a. l.	6	54 72	25.01 m. increase; extension to Sioux City.	122
3544	4141	7685	7085	256	in b. c.; no r. a.	15*	54 00	\$150 for m. m.; m. increase.	123
8648	4951	13599	11024	367	in b. c.; no r. a.	12	53 87	In Apr., 1878.	124
10473	6070	16545	10916	363	13.5 by 9, f. f., a. l.	6	53 87	In Mar., 1879.	125
19310	13707	33017	17158	571	11.9 by 8.9½, f. f., a. l.	12	53 86½	.32 m. decrease.	126
79800	50673	130473	28996	966	13.5 by 6.10 (av.), f. f., d. l. between Grand Rapids and Cadillac, 98 m.; a. l. residue.	14.2*	53 35½	1.48 m. increase.	127
14892	12225	27117	16538	551	11.8 by 6.5, f. f., a. l.	7.39*	53 01	20 m. from Jan. 14, 1879. In May, 1879.	128
10754	7743	18497	8523	284	19.6 by 8.10, f. f., a. l.	6	53 01	1.80 m. increase.	129
14308	10806	25114	15616	520	no apt.; no r. a.	12	52 20	Branch; main route, \$132.52½ (35). In Mar., 1879.	130
12811	13311	26122	13205	442	10.8 by 8.8, 10 by 10.7, f. f., a. l.	6.1*	52 00	.64 m. decrease.	131
12136	6714	18850	11116	370	11 by 7.4, f. f., a. l.	6	52 00	2.61 m. increase.	132
16448	12920	29368	8135	271	12 by 5.6, f. f., a. l.	6	52 00	1.60 m. decrease.	133
20161	11878	32039	31339	1044	7.7 by 6.10, f. f., a. l.	12	51 30	Branch; main route, \$58.14 (113); .16 m. increase.	134
10800	15228	26028	16461	546	23.5 by 8.10, f. f., a. l.	12	51 30	Main route; branch, \$51.30 (137); 1.05 m. increase.	135
5785	6181	11966	13123	437	13 by 7.6, f. f., a. l.	12	51 30	.10 m. increase.	136
269	862	1131	1131	37	in b. c.; no r. a.	6	51 30	Branch; main route, \$51.30 (135); 1.15 m. increase.	137
5205	7696	12901	8809	295	9.10 by 7.4, f. f., a. l.	6	50 44½	.25 m. decrease.	138
10631	10351	20982	16261	542	12.2 by 9.5, f. f., a. l.	12	50 00	.09 m. increase.	139
12176	12759	24935	13575	452	18.3 by 7, f. f. c., a. l.	6	50 00	5.79 m. from Jan. 1, 1879.	140
10152	10277	20429	12599	419	10.4 by 6, f. f., a. l.	13.5*	50 00	20.80 m. at \$55.57½	141
10151	9796	19947	11428	380	11 by 5.2, f. f.; no r. a.	13.5*	50 00	20.8 m. from Mar. 1, 1878. In Nov., 1878.	142
10084	5849	15943	10083	366	10.4 by 6.8, f. f., a. l.	9.05*	50 00	.18 m. decrease.	143
								16.81 m. from Jan. 1, 1879.	144
8440	9637	18077	10639	364	20 by 7.6, f. f., a. l.	6	50 00	.39 m. increase.	145
87211	35112	122323	10746	358	16 by 9.8, f. f., a. l.	8.6*	50 00		146
8119	9999	18118	10000	333	10.2 by 7.1 (av.), f. f., a. l.	6	50 00	1.17 m. decrease.	147
14554	12464	27018	9950	331	11.9 by 9, f. f., a. l.	6	50 00	2.02 m. decrease.	148
			17932	299	13.6 by 6.7, 9.11 by 6.9 f. f., a. l.	12	50 00	In Aug., 1878. Combined with returns of 1877.	149

E.—Table showing the weight of the mails, the speed with which they

Order.	State.	Number of route.	New number of route.	Termini.	Corporate title of company carrying the mail.	Length of route. Miles.	Miles per hour.
149	Wis	25008		Oshkosh, Ripon	Chicago, Milwaukee and Saint Paul.	20.95	14
150	Mo	28024		Holden, Paola	Missouri, Kansas and Texas	55	12
151	Wis	25019		Sheboygan, Princeton	Sheboygan and Fond du Lac	78.79	16
152	Ill	23043		Streator, Altamont	Chicago and Paducah	156.81	19
153	Mich	24024		Ypsilanti, Bankers	Detroit, Hillsdale and Southwestern.	65.5	15
154	Wis	25021		Calamine, Platteville	Mineral Point	18.97	15
155	Ill	23044		Mattoon, Hovey City	Decatur, Mattoon and Southern	31.37	12
156	Ill	23025		Maysville, Pittsfield	Wabash	6	23
157	Mich	24026		Grand Rapids, White Cloud	Grand Rapids, Newaygo and Lake Shore.	47.03	14
158	Mich	24037		Saint Clair, Richmond	Michigan Midland and Canada.	16.76	16
159	Iowa	27024		Clinton, Anamosa	Iowa Midland.	71.57	20
160	Ill	23004		Elgin, Geneva	Chicago and Northwestern	43.65	27
161	Minn	26006		White Bear Lake, Stillwater	Saint Paul and Duluth	13.20	16
162	Mich	24019	24007	Kalamazoo, South Haven	Michigan Central	40.65	11
163	Iowa	27023		Benlah, Elkader	Iowa Eastern	18.49	12
164	Iowa	27013		Stanwood, Tipton	Chicago and Northwestern	9.44	19
165	Ill	23056		Geneva, Batavia	do	3.86	18
166	Wis	25005		Watertown, Madison	Chicago, Milwaukee and Saint Paul.	39.05	21
167	La	30004	30004	Terre Bonne, Houma	Morgan's Louisiana and Texas	15.33	25
168	Mich	24027	24012	Niles, South Bend	Michigan Central	12.25	16
169	Wis	25024		Elk Horn, Eagle	Western Union	17.94	14
170	Minn	26003		Saint Paul, Sauk Rapids	Saint Paul, Minneapolis and Manitoba.	76.3	18
171	Pa	8104		South West Junction, Oil- phant Furnace.	Pennsylvania	41.9	21
172	Ill	23007		Galva, Sagetown	Chicago, Burlington and Quincy	76.82	11
173	Mich	24028	24005	Jonesville, Lansing	Lake Shore and Michigan Southern.	60.86	14
174	Ill	23051		Joliet, Peoria	Chicago, Pekin and Southwestern.	126.02	31
175	Ill	23008		Rushville, Yates City	Chicago, Burlington and Quincy	61.92	20
176	Mo	28013		Brunswick, Pattonsburgh	Hatch and Van Every (leases Brunswick, Chillicothe, Saint Louis, Council Bluffs and Omaha Railroad).	80.05	15
177	N. H.	1010		Contoocook Village, Peter- borough.	Concord and Claremont	32.76	19
178	Ill	23053		East Saint Louis, Cairo	Cairo and Saint Louis	154.80	18.5
179	Ohio	21051		Columbus, Portsmouth	Scioto Valley	102.10	25
180	Iowa	27015		Des Moines, Indianola	Chicago, Rock Island and Pa- cific.	22.07	19
181	Minn	26019	26020	Worthington, Sioux Falls	Worthington and Sioux Falls	63.07	16
182	Minn	26014		Saint Peter, Gary	Winona and Saint Peter	156.63	15
183	Minn	26016	26023	La Crosse, Jackson	Southern Minnesota	217.56	18
184	Iowa	27005		Red Oak, Eastport	Chicago, Burlington and Quincy	50	22
185	Cal	46022		Woodland, Willow	Northern Railway	65.19	16
186	Wis	25027	25015	Stevens Point, Portage	Wisconsin Central	72.30	18.5

are conveyed, the accommodations for mails and agents, &c.—Continued.

Whole weight carried any distance for thirty days.			Average weight carried whole distance.		Size, &c., of mail-car or apartment.	Trips per week.	Pay per mile per annum.	Remarks.	Order.
Outward.	Inward.	Total.	30 days total.	Per day total.					
Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Feet and inches.		Dolls.		
5785	3643	9428	8338	277	12 by 7.2, f. f., s. 1	12	50 00	.05 m. decrease	149
8917	4975	13892	7951	265	13.9 by 7.4, f. f., s. 1	6	50 00		150
9513	9071	18584	7945	264	10 by 7.3, f. f., s. 1	12	50 00	\$.80 for m. m.; .26 m. decrease.	151
13672	13841	27513	7785	259	11 by 7, f. f., s. 1	6	50 00	.01 m. increase	152
8320	6629	14949	7797	259	8.9 by 7, f. f., s. 1	6	50 00	.04 m. decrease	153
4188	2751	6939	5911	197	no apt.; no r. a.	12	50 00	.13 m. increase	154
4985	4625	9610	5729	190	12 by 7.4, f. f., s. 1	6	50 00	1.68 m. decrease	155
3641	2022	5673	5673	189	no apt.; no r. a.	18	50 00	Branch; main route \$131 (37).	156
3928	4280	10208	5488	182	7 by 4, f. f., s. 1	12	50 00		157
1527	3715	5242	5066	168	no apt.; no r. a.	12	50 00		158
246	5948	13494	5019	167	— by —, s. 1	6	50 00	2.53 m. decrease	159
6393	4237	10630	4925	164	9.6 by 9.5, f. f., s. 1	6	50 00	.35 m. decrease	160
3394	1047	4441	4441	147	in b. c.	12	50 00		161
4828	3580	8408	4251	141	12.7 by 6.6, f. f., s. 1	6	50 00	.91 m. increase	162
3184	2706	5890	4209	140	no apt.; no r. a.	6	50 00	.10 m. decrease	163
2584	1578	4162	4162	138	no apt.; no r. a.	12	50 00	.63 m. increase	164
910	2039	2949	2949	98	in b. c.; no r. a.	12	50 00	.16 m. increase	165
3486	3049	6535	2833	94	13.7 by 7.5, f. f., s. 1	6	50 00	.60 m. increase	166
1543	729	2272	2272	75	no r. a.	7	50 00	.05 m. increase. In Apr., 1878.	167
1283	875	2158	1797	59	in b. c.; no r. a.	9*	50 00	.05 m. increase	168
903	765	1758	1032	34	in b. c.; no r. a.	6	50 00	Branch; main route \$68.40 (82); .16 m. decrease.	169
36544	15243	51787	43386	1446	18 by 8.7, f. f., s. 1	12	49 93½		170
13381	8894	22275	12658	421	10 by 8.3, f. f., s. 1	6	49 50	4.6 m. from Apr. 10, 1878. In Feb., 1879.	171
6894	9706	18600	9012	300	8.9½ by 6.8½, f. f., s. 1	7.1*	49 50	Branch; main route \$332.69, \$310.19 (3); .46 m. decrease; .01 m. decrease.	172
8233	7875	16108	8430	281	17.8 by 9.4, f. f., s. 1	8.3*	49 59		173
11064	9988	21052	8728	290	9.4½ by 7.2½, f. f., s. 1	6	48 74		174
13204	15946	29150	14647	488	13.5½ by 6.8, f. f., d. 1. to Lewiston, 30.31 m., s. 1. res.	16.7*	48 73½	Main route; branch \$55.57½ (120); .17 m. increase.	175
10853	7252	18105	9630	321	8.8 by 7, fixtures, s. 1	8.84*	48 73½		176
6438	5050	11488	6189	206	7 by 6, f. f., s. 1	8.6*	48 60½	17.76 m. from Sept. 2, 1878. In May, 1879.	177
12642	11081	30303	11116	370	9.10 by 6.6 (av.), f. f., s. 1	6	47 88	6.30 m. increase	178
31114	16468	47582	22949	764	9.4 by 6.8, f. f., s. 1	13.53*	47 02½	50.84 m. from Jan. 21, 1878. In Nov. 1878.	179
17600	10499	28099	14088	469	9 by 7, f. f., s. 1	14.3*	47 02½	Main route; branch \$42.75 (233); .67 m. increase.	180
2225	4851	13676	9294	309	11.11 by 9.3, f. f., s. 1	6	47 02	.02 m. increase	181
26957	15085	42622	11381	379	15.3 by 7.6, 11.10 by 9.5, f. c., s. 1	12	46 80	79.66 m. at \$21.60; 40.97 m. at \$43.77, from July 1, 1878. In Oct., 1878.	182
31875	17381	49256	17366	578	21.3 by 9.3, f. f., s. 1	6	46 51½	20.62 m. from Aug. 1, 1878; 26.25 m. from Jan. 1, 1879; .20 m. increase.	183
16625	6072	23597	16449	548	13.6 by 6.6, f. f., s. 1	6	46 51½	Branch; main route \$183.64 (20).	184
10447	6182	16629	11122	370	10 by 9, f. f., s. 1	6	46 17	25.47 m. from Nov. 1, 1878. In Feb., 1879.	185
10201	6708	17309	3052	301	7.7 by 6.10, f. f., s. 1	6	46 17	.07 m. increase	186

E.—Table showing the weight of the mails, the speed with which they

Order.	State.	Number of route.	New number of route.	Termini.	Corporate title of company carrying the mail.	Length of route. Miles.	Miles per hour.
187	Wis.	25017		Menasha, Ashland	Wisconsin Central	250.42	25
188	N. H.	1004		Hookset, Pittsfield	Concord	20.35	18
189	Mich.	24041	24040	Marquette, L'Anse	Marquette, Houghton and Ontonagon.	63.48	20
190	Colo.	38003		Forks Creek, Central City	Colorado Central	12.07	12
191	Iowa	27031		Des Moines, Fort Dodge	Des Moines and Fort Dodge	87.90	18
192	Ill.	23024		Peoria, Decatur	Pekin, Lincoln and Decatur	80.02	25
193	Wis.	25018		Manitowoc, Clintonville	Milwaukee, Lake Shore and Western.	80.09	17
194	Ill.	23049		Springfield, Havana	Springfield and Northwestern.	47.48	20
195	Tex.	31015		Henderson, Overton	Henderson and Overton	15.53	10
196	Pa.	8114		Washington, Waynesburgh	Washington and Waynesburgh	28.72	10
197	Mich.	24032	24022	Muskegon, Big Rapids	Chicago and West Michigan	55.5	18
198	Mo.	28028		Oronogo, Joplin	Missouri and Western	3.33	20
199	Pa.	8117		Newtown Junction, New town.	Philadelphia, Newtown and New York.	27.10	25
200	N. J.	7032		Whiting, Long Beach	Tuckerton	28.06	25
201	Ill.	23045		Carbondale, Marion	Carbondale and Shawneetown	18.36	18
202	Pa.	8109		Abington, Breadysville	Northeast Pennsylvania	11.30	25
203	Pa.	8116		Honesdale, Carbondale	Delaware and Hudson Canal	17.30	15
204	Ohio	21058		Jackson, Springfield	Springfield, Jackson and Pomeroy.	108.92	19
205	R. I.	4008		Riverpoint, Hope	Pawtuxet Valley	3.10	12
206	Wis.	25007		Nepeuskun, Winneconne	Chicago, Milwaukee and Saint Paul.	14.29	14
207	Mo.	28036		Springfield, Ash Grove	Springfield and Western Missouri.	20.06	15
208	Conn.	5020		Turnerville, Colchester	Boston and New York Air-Line.	4.19	14
209	N. H.	1003		Manchester, North Weare	Concord	19.95	20
210	Pa.	8112		Foxburgh, Turkey City	Foxburgh, Saint Petersburg and Clarion.	8.00	15
211	Miss.	18010		Natchez, Red Lick	Natchez, Jackson and Columbus.	34.32	12
212	Ohio	21059		Cincinnati, Hamilton and Dayton Junction, Mount Healthy.	G. H. Burrows (Lease College Hill R. R.).	7.08	15
213	Iowa	27039		Turkey River, Wadena	Chicago, Clinton, Dubuque and Minnesota.	44.65	19
214	Cal.	46025		West Oakland, Berkeley	Central Pacific (West Berkeley Branch).	5.9	11
215	Pa.	8115		Pittsburgh, Finleyville	Pittsburgh Southern	19.26	15
216	N. J.	7042		Delaware Station, Blairstown.	Blairstown	11.30	15
217	Mass.	3072		Boston, Waltham	Fitchburg	10.90	15
218	Mo.	28016		Pleasant Hill, De Soto Junction.	Atchison, Topeka and Santa Fé.	46.8	10
219	Ind.	22037		Anderson, Noblesville	Anderson, Lebanon and Saint Louis.	20.20	20

are conveyed, the accommodations for mails and agents, &c.—Continued.

Whole weight carried any distance for thirty days.			Average weight carried whole distance.		Size, &c., of mail-car or apartment.	Trips per week.	Pay per mile per annum.	Remarks.	Order.
Outward.	Inward.	Total.	30 days, total.	Per day, total.					
Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Feet and inches.		Dolls.		
21646	12242	33888	8749	291	7.7 by 8.10, f. f., a. l. to Phillips, 172.42 m.; no r. a. res., 78 m.	6	46 17	.60 m. decrease, 6 trips to Phillips, 172.42 m.; 3 res., 78 m.	187
			13701	228	7 by 4.6, f. f., a. l.	6	45 90	In Aug., 1878. Combined with returns of 1877.	188
13912	9381	23293	13781	526	12 by 7.2, f. f., a. l.	7.3*	45 82	Main route; branch \$34.20 (\$53); .02 m. increase.	189
5600	2716	8316	7544	251	in b. c.	7	45 32	4.17 m. from July 1, 1878. Branch; main route not weighed.	190
12881	10717	23598	13784	459	16.6 by 8.9, f. f., a. l.	7.8*	45 31	1.14 m. decrease	191
9754	9901	19655	12320	417	10 by 7.6, f. f., a. l.	9	45 00	11.56 m. ext. from Mar. 1, 1879.	192
9609	11049	20658	10685	356	11 by 7.11 f. f., a. l. to New London, 62.4 m.	7.2*	45 00	Branch; main route \$75 (69), .50 m. increase; 21.06 m. at \$51.30; 13.94 m. from Nov. 1, 1878.	193
6328	5257	11585	6643	221	12.6 by 6.3, f. f., a. l.	7.3*	45 00	72 m. decrease	194
4100	1676	5776	5976	199	14 by 9; no r. a.	7	45 00	in Jan., 1879	195
4338	4198	8536	5940	198	9 by 4.7, f. f.; no r. a.	12	45 00	in Oct., 1878	196
6040	4723	10772	5884	196	10.3 by 8.10, f. f., a. l.	6	45 00	1.14 m. decrease	197
3711	2125	5836	5053	168	in b. c.; no r. a.	7	45 00	Branch; main route \$65.83 (92). Title reported St. Louis and San Francisco.	198
3694	2440	6134	4862	162	in b. c.; no r. a.	12	45 00	In Dec., 1878	199
			9600	160	8 by 7, f. f., d. l.	12	45 00	Combined weighings of Apr., 1877, and July, 1878.	200
3365	2049	5414	4376	145	in b. c.; no r. a.	12	45 00	36 m. increase	201
3633	2339	5972	3882	129	in b. c.; no r. a.	12	45 00	In Feb., 1879	202
2147	2628	4775	3906	128	in b. c.; no r. a.	12	45 00	In Dec., 1878	203
5895	6908	12713	3451	115	16 by 8, f. f., a. l.	6	45 00	83.19 m. from Sept. 2, 1878. In June, 79.	204
2648	1754	4402	3271	109	no apt.; no r. a.	7.9*	45 00	In Feb., 1879	205
2929	1829	4758	3162	105	in b. c.; no r. a.	6	45 00	1.96 m. decrease	206
2481	1259	3740	2922	97	12 by 8, f. f.; no r. a.	6	45 00		207
1808	1042	2850	2850	95	no r. a.	7.5*	45 00	In Jan., 1879	208
			5486	91	no apt.; no r. a.	6	45 00	In Aug., 1878. Combined with returns for 1877.	209
2802	1063	4765	2694	89	in b. c.; no r. a.	18	45 00	In Jan., 1879	210
1915	2278	4193	2420	80	10 by 7.6, f. f., a. l.	7	45 00	26 m. from Sept. 1, 1877; residue, 8.32 m., from July 1, 1878. In July, 1878.	211
1885	1339	3224	2285	76	no apt.; no r. a.	24	45 00	In Nov., 1878	212
2730	1888	4618	2248	75	7.7 by 7.1, a. l.	6	45 00	In May, 1878	213
1200	940	2140	2140	71	in b. c.; no r. a.	13	45 00	In Apr., 1878	214
2072	1206	3278	1906	63	in b. c.; no r. a.	6	45 00	6.71 m. from Oct. 15, 1878. In Feb., 1879.	215
1800	1022	2822	1883	62	in b. c.; no r. a.	6	45 00	In Feb., 1879	216
1832	1184	3036	1741	58	no apt.; no r. a.	14.8*	45 00	In May, 1879	217
1441	891	2332	1581	52	11.6 by 9; no r. a.	6	45 00	In Oct., 1878. Service to Stanley, 26 m.	218
1117	1079	2196	1223	40	in b. c.; no r. a.	6	45 00	In Sept., 1878	219

E.—Table showing the weight of the mails, the speed with which they are

Order.	State.	Number of route.	New number of route.	Termini.	Corporate title of company carrying the mail.	Length of route.	Miles per hour.
						Miles.	
220	Pa....	8033	.....	Junction, East Berlin.....	Hanover Branch.....	7.21	16
221	Iowa..	27008	.....	Burlington, La Cede.....	Burlington and Southwestern.	182.37	19
222	Ill....	23050	.....	Vincennes, Danville.....	Paris and Danville.....	114.91	20
223	Mo....	28012	.....	Saint Joseph, Lexington....	Saint Louis, Kansas City and Northern.	76.86	18
224	Mo....	28008	.....	Tipton, Boonville.....	Missouri Pacific.....	25.75	18
225	Iowa..	27002	.....	Cedar Rapids, Postville.....	Burlington, Cedar Rapids and Northern.	99.80	16
226	Iowa..	27027	.....	Davenport, Fayette.....	Davenport and Saint Paul....	129.33	18
227	N. Y..	6080	.....	Canastota, De Ruyter.....	Cazenovia, Canastota and De Ruyter.	29.60	21
228	Mich..	24022	24039	Port Huron, Flint.....	Northwestern Grand Trunk (late Chicago and Lake Huron).	66.15	16
229	Ill....	23029	.....	Urbana, Havana.....	Indianapolis, Bloomington and Western.	103.14	23
230	Mich..	24020	24038	Lansing, Fort Wayne Junction.	Chicago and Lake Huron.....	167.75	20
231	Mich..	24039	24025	Flint, Lansing.....	Chicago and Northeastern....	50.18	25
232	Iowa..	27003	.....	Cedar Rapids, Holland.....	Burlington, Cedar Rapids and Northern.	50.45	12
233	Iowa..	27015	.....	Somerset Junction, Winter-set.	Chicago, Rock Island and Pacific.	27.04	19
234	Wis...25020	.....	.....	Warren, Mineral Point.....	Mineral Point.....	33.49	15
235	Iowa..	27029	.....	California Junction, Fremont.	Sioux City and Pacific.....	32.23	15
236	Wis...25023	.....	.....	Madison, Portage.....	Chicago, Milwaukee and Saint Paul (operating Chicago and Superior).	40.73	21
237	Wis...25022	25031	.....	Tomah, Wausau.....	Wisconsin Valley.....	91.61	18
238	Mo....28017	.....	.....	Sedalia, Lexington.....	Missouri Pacific (deserves Lexington and Saint Louis).	54.25	18
239	Ill....23026	.....	.....	Ambia, Bloomington.....	La Fayette, Bloomington and Mississippi.	81.06	24
240	Mo....28009	.....	.....	Centralla, Columbia.....	Saint Louis, Kansas City and Northern.	22.14	18
241	N. C...13010	.....	.....	Raleigh, Hamlet.....	Raleigh and Augusta Air-Line.	101.28	15
242	Mich..24030	.....	.....	East Saginaw, Saint Louis..	Saginaw Valley and Saint Louis.	35.23	18
243	Ill....23055	.....	.....	Decatur, Bruins Junction...	Indianapolis, Decatur and Springfield.	101.97	21
244	Mich..24034	.....	.....	Walton, Traverse City.....	Traverse City R. R. (late Continental Improvement Company).	26.26	19
245	Mo....28021	.....	.....	Mexico, Cedar City.....	Chicago and Alton.....	50.62	13
246	Iowa..27016	.....	.....	Washington, Knoxville.....	Chicago, Rock Island and Pacific.	78.83	25
247	Wis...25026	.....	.....	Ean Claire, Chippewa Falls.	Chippewa Falls and Western..	11.67	20
248	Mo....28025	.....	.....	Salisbury, Glasgow.....	Saint Louis, Kansas City and Northern.	15.99	13
249	Ill....23013	.....	.....	Mendota, Clinton.....	Chicago, Burlington and Quincy.	65.59	12
250	Mich..24012	24023	.....	Lenox, Romeo.....	Michigan Air-Line.....	16.13	18
251	Iowa..27009	.....	.....	Villisca, Clarinda.....	Burlington and Missouri River.	17.22	13
252	Iowa..27033	.....	.....	Albia, Knoxville.....	Chicago, Burlington and Quincy.	35.49	19
253	Ind...22003	.....	.....	Lawrenceburgh, Lawrenceburgh Junction.	Indianapolis, Cincinnati and La Fayette.	2.06	20
254	Wash. Ter. 43003	.....	.....	Olympia, Tenino.....	Thurston County Railroad Construction Company.	15.31	19
255	Ill....23034	.....	.....	Springfield, Gilman.....	Illinois Central.....	112.57	22
256	Iowa..27006	.....	.....	Chariton, Leon.....	Burlington and Missouri River.	39.10	18
257	Iowa..27034	.....	.....	Sioux City, Beloit.....	Sioux City and Pembina.....	65.18	16

conveyed, the accommodations for mails and agents, &c.—Continued.

Whole weight carried any distance for thirty days.			Average weight carried whole distance.		Size, &c., of mail-car or apartment.	Trips per week.	Pay per mile per annum.	Remarks.	Order.
Outward.	Inward.	Total.	30 days, total.	Per day, total.					
Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Feet and inches.		Dolla.		
856	589	1545	1068	35	10 by 6, f. f., no r. a.	6	45 00	Branch; main route \$62.15½. In Jan., 1879.	230
16003	11808	27811	8814	293	14 by 9, f. f., a. l.	6	44 46	1.15 m. decrease	221
9186	11672	20858	7653	255	10 by 6, f. f., a. l.	6	44 46	.72 m. increase	222
9373	13848	23221	12998	433	25.5½ by 7.7½, f. f., d. l.	14	43. 60½	.11 m. increase	223
6209	3778	9987	7936	264	no r. a.	6	43. 60½	.....	224
12104	8488	20592	7167	238	10.4 by 7.8, f. f., a. l.	9	43. 60½	.....	225
10571	11492	22063	6839	227	10.6 by 6.11 (av.), f. f., a. l.	6	43. 60½	.....	226
11360	9077	20437	15697	523	11.8 by 6.5, f. f., a. l.	7. 5*	42. 75	14.60 m. from Feb. 10, 1879. In May, 1879.	227
11214	11537	22751	13872	462	13 by 7 (av.), f. f., a. l.	9. 09*	42. 75	.44 m. decrease	228
15785	14023	29808	13370	445	9.9 by 7.2, f. f., a. l.	6	42. 75	Main route; branch \$38.47½ (335); .44 m. increase.	229
16242	18976	35218	12632	421	13.6 by 6.6, f. f., a. l.	6	42. 75	1.55 m. increase	230
7860	8647	16507	12182	406	13.6 by 6.6, f. f., a. l.	6	42. 75	.....	231
11857	7361	19218	11768	392	10.2 by 9.3, f. f., a. l.	6	42. 75	25.68 m. from Sept. 1, 1877.	232
8674	6351	15225	11406	383	9 by 7, f. f., a. l.	12	42. 75	Branch; main route \$47.02½ (180); .06 m. decrease.	233
11061	6357	17418	11404	380	no apt.; no r. a.	12	42. 75	.49 m. increase	234
11760	8121	19881	11372	379	13.5 by 9, f. f., a. l.	6	42. 75	Branch; main route \$90.63 (56).	235
5008	8175	13183	10207	340	13.7 by 7.5, f. f., a. l.	6	42. 75	1.23 m. increase	236
11074	7854	18928	10165	338	10.11 by 8.10, f. f., a. l.	6	42. 75	1.57 m. increase	237
8655	5993	14648	10110	337	10.6 by 7, f. f., a. l.	6	42. 75	.....	238
9877	10415	20292	9789	326	14 by 7.6, f. f., a. l.	6	42. 75	.06 m. decrease	239
6296	3829	10127	9150	305	25.5½ by 7.7½; no r. a.	18	42. 75	.14 m. increase	240
12254	7135	19389	8763	292	12 by 9, f. f., a. l.	6	42. 75	42.5 m. from Dec. 1, 1877. In May, 1879.	241
5915	4873	10788	8103	270	8 by 5.9, f. f., a. l.	12	42. 75	.....	242
14307	15326	29633	7965	265	16.8½ by 7.3, f. f., a. l.	6	42. 75	14.97 m. from Aug. 15, 1878.	243
6014	2721	8735	7811	260	no apt.; no r. a.	6	42. 75	.....	244
5976	6925	12901	7744	258	17.5½ by 9, f. f., a. l.	6	42. 75	.....	245
11159	6970	18129	7513	250	10 by 9, f. f., a. l.	7. 5*	42. 75	25.23 m. from Mar. 15, 1877; .41 m. decrease.	246
5323	2221	7544	7220	240	in b. c.; no r. a.	15	42. 75	.....	247
4677	2617	7294	6783	226	25.5½ by 7.7½; no r. a.	13	42. 75	.33 m. increase	248
6630	5889	12519	6642	221	8.7 by 6.9, f. f., a. l.	8. 2*	42. 75	1.40 m. increase	249
4784	2192	6976	6171	205	no apt.; no r. a.	12	42. 75	.....	250
4233	2050	6283	5944	198	no apt.; no r. a.	12	42. 75	1.22 m. increase	251
5384	3436	8820	5931	197	6.9 by 6, f. f., a. l.	6	42. 75	1.52 m. increase	252
1933	3960	5893	5883	196	in b. c.; no r. a.	76	42. 75	Branch; main route \$287.30; not weighed. In Dec., 1878.	253
2519	3933	6452	5794	193	10 by 3.6; no r. a.	12	42. 75	In Mar., 1879.	254
8728	8611	17339	5742	191	11.9 by 9.4, f. f., a. l.	7. 5*	42. 75	.97 m. increase	255
4729	2451	7177	5626	184	16 by 6.6, f. f., a. l.	6	42. 75	1.66 m. increase	256
5608	3018	8626	5319	177	in b. c.; no r. a.	6	42. 75	13.2 m. from Nov. 1, 1878; 21.97 m. from Feb. 20, 1879.	257

E.—Table showing the weight of the mails, the speed with which they

Order.	State.	Number of route.	New number of route.	Termini.	Corporate title of company carrying the mail.	Length of route. Miles.	Miles per hour.
258	Kans.	33013		Leavenworth, Onaga	Kansas Central	84.23	15
259	Tex.	31013		Jefferson, Sulphur Springs	East Line and Red River	91.66	11
260	Ohio	21060		Columbia, Amelia	Cincinnati and Portsmouth	20.4	12
261	Ill.	23057		Rochelle, Rockford	Chicago and Iowa	27.70	21
262	Wis.	25029		Lone Rock, Richland Centre.	Pine River Valley and Stevens Point.	16.31	12
263	N. J.	7043		Keyport, Freehold	Freehold and New York	14.14	23
264	Ill.	23014		Rock Falls, Shabbona	Chicago, Burlington and Quincy	47.46	10
265	Wis.	25032		Woodman, Lancaster	Chicago and Tomah.	30.69	12
266	Mo.	28033		Kansas City, Lexington	Wyandotte, Kansas City and Northern.	43.35	15
267	Iowa	27004		Muscatine, Riverside	Burlington, Cedar Rapids, and Northern.	32.23	19
268	Ill.	23060		Parkersburgh, Mattoon	Grayville and Mattoon	69.68	18
269	Ill.	23027		La Harpe, Burlington	Toledo, Peoria and Warsaw	20.47	20
270	Ill.	23019		Washington, Dwight	Chicago and Alton	70.08	21
271	Mich.	24023		Allegan, Muskegon	Grand Haven	59.28	20
272	Wis.	25028		Hudson, Clayton	North Wisconsin	44	11
273	Iowa	27032		Grinnell, Montezuma	Grinnell and Montezuma	17.44	12
274	Pa.	8122		Allegheny Bridge, Bradford.	Kendall and Eldred	21.94	15
275	Minn.	28022		Wabasha, Zumbrota	Minnesota Midland	50.09	15
276	Mich.	24044	24020	Toledo, Ann Arbor	Toledo and Ann Arbor	46.15	23
277	Kans.	33024		Parsons, Weir	Memphis, Kansas and Colorado	31.12	12
278	Iowa	27018		Davenport, Maquoketa	Davenport and Northwestern	42.78	15
279	Iowa	27043		Hastings, Sidney	Chicago, Burlington and Quincy	23.81	12
280	Ill.	23061		El Dorado, Benton	Belleville and El Dorado	31.94	12
281	S. C.	14011		Spartanburgh, Hendersonville.	Spartanburgh and Asheville	48.36	18
282	La.	30009		Terre Bonne, Thibodeaux	Morgan's Louisiana and Texas	5.75	17
283	Mich.	24043	24014	East Saginaw, Caro	Detroit and Bay City	32.72	17
284	N. Y.	6104		Sardinia Junction (n. o.), Springville.	Springville and Sardinia	11.50	12
285	N. C.	13011		Fayetteville, Gulf.	Western	44.97	15
286	Pa.	8119		Shenandoah, Mahanoy Plane	Philadelphia and Reading	7.02	14
287	Maine	19		Mechanics Falls, Canton	Rumford Falls and Buckfield	27.71	19
288	Ill.	23059		Rock Island, Cable	Rock Island and Mercer County	26.12	12
289	Ill.	23007		Aurora, Galena Junction	Chicago, Burlington and Quincy	14.39	17
290	Minn.	28024	28018	Chatfield, Plainview	Winona and Saint Peter	28.47	15
291	Ill.	23058		West Lebanon, Le Roy	Havana, Rantoul and Eastern	76.5	11
292	Ga.	15026		Toccoa, Elberton	Elberton Air Line	51	15
293	Iowa	27044		Atlantic, Audubon	Chicago, Rock Island and Pacific.	28.01	15
294	N. J.	7036		Summit, Bernardsville	Passaic and Delaware	14.78	20
295	N. Y.	6105		Plattsburgh, Danemora	Plattsburgh and Danemora	17.09	20
296	Ill.	23062		Kankakee, Chateworth	Kankakee and Southwestern	41.78	15
297	R. I.	4009		Wood River Junction, Hope Valley.	Wood River Branch	5.87	12
298	Wis.	25030	25013	Onalaska, La Crosse	Chicago and Northwestern	8.51	21
299	Tex.	31016		Corpus Christi, Collins	Corpus Christi, San Diego and Rio Grande Narrow Gauge.	40	12

are conveyed, the accommodations for mails and agents, &c.—Continued.

Whole weight carried any distance for thirty days.			Average weight carried whole distance.		Size, &c., of mail-car or apartment.	Trips per week.	Pay per mile per annum.	Remarks.	Order.
Outward.	Inward.	Total.	30 days, total.	Per day, total.					
Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Feet and inches.		Dolls.		
7693	4249	11342	5196	173	7.6 by 5, f. f., s. l.	6	42 75	In June, 1879	258
7676	4055	11731	5138	171	9 by 7, f. f., s. l.	6	42 75	7 m. from Aug. 11, 1878; 12.55 m. from Jan. 1, 1879; 22.91 m. from May 1, 1879. In June, 1879.	250
5243	3396	8639	5043	168	10.5 by 5.2, f. f., s. l.	12	42 75	In Mar. and Apr., 1879.	260
2908	3933	6933	5022	167	no apt.; no r. a.	6	42 75	.06 m. increase	261
3727	2303	6030	4904	163	in b. c.; no r. a.	12	42 75	.19 m. decrease	262
4063	2731	6794	4854	161	in b. c.; no r. a.	12	42 75	In Feb., 1879	263
4898	4350	9248	4822	160	6.11 by 6.4, f. f., s. l.	6	42 75	.23 m. increase	264
3926	3001	6927	4825	160	in b. c.; no r. a.	6	42 75	.22 m. decrease	265
5696	5067	10763	4647	154	8 by 5.1, f. f., s. l.	6	42 75		266
3896	3441	7337	4607	153	10.4 by 7.8, f. f., s. l.	6	42 75		267
5791	6567	12358	4566	152	10 by 7, fixtures, s. l.	6	42 75		268
3148	2104	5252	4568	152	in b. c.; no r. a.	12	42 75	Branch; main route \$70 (79); 1.22 m. increase.	269
5622	6855	12477	4588	152	13.10 by 9.5, f. f., s. l.	6	42 75	Main route; branch, \$42.75 (320.)	270
6022	4354	10376	4512	150	12.6 by 9.3, f. f., s. l.	6	42 75	.91 m. increase	271
4916	3278	8194	4462	148	7.6 by 6.6, f. f., s. l.	6	42 75		272
2949	2173	5022	4388	146	no apt.; no r. a.	12	42 75	3.01 m. increase	273
5443	4145	9588	4397	146	in b. c.; no r. a.	6	42 75	In May, 1879	274
3749	2322	6071	4107	136	9.11 by 6.1, f. f.; no r. a.	6	42 75	.57 m. decrease	275
3006	4133	7139	3963	132	no apt.; no r. a.	6	42 75	.53 m. increase	276
3914	3559	7473	3890	129	10 by 6, f. f., s. l.	6	42 75	5.41 m. from Oct. 1, 1878. In Feb., 1879.	277
4156	3668	7824	3828	127	11.6 by 6.6, f. f., s. l.	6	42 75		278
2973	2243	5216	3797	126	no apt.; no r. a.	12	42 75	2.74 m. increase	279
4146	3815	7961	3684	122	in b. c.; no r. a.	6	42 75	10.71 m. from Jan. 1, 1879; .95 m. decrease.	280
4127	2276	6403	3581	119	9 by 9, f. f., s. l.	6	42 75	11 m. from Aug. 1, 1878; 2.11 m. from May 1, 1879; 8.35 m. from July 1, 1879. In July, 1879.	281
1250	2331	3581	3581	119	in b. c.; no r. a.	7	42 75	In May, 1879	282
4862	3129	7991	3519	117	no apt.; no r. a.	15.6	42 75	20.55 m. from Mar. 16, 1879.	283
2518	1912	4430	3438	114	in b. c.; no r. a.	12	42 75	In May, 1879	284
2783	3991	6774	3412	113	11 by 6, f. f., s. l.	6	42 75	2.97 m. from Apr. 1, 1879. In June, 1879.	285
1661	1660	3321	3340	111	no apt.	12	42 75	In Dec., 1878	286
3446	1657	5143	3334	111	no apt.; no r. a.	6	42 75	In May, 1879	287
4647	2147	6794	3324	110	no apt.; no r. a.	6	42 75		288
3682	2484	6166	3316	110	in b. c.; no r. a.	15	42 75	Branch; main route, \$332.69, \$310.19 (3); 1.39 m. increase.	289
4666	3453	8119	3321	110	no apt.	12	42 75	16.28 m. from Jan. 1, 1879; 12.40 m. from Feb. 1, 1879; .21 m. increase.	290
6402	6124	12525	3298	109	11 by 6.6, f. f., s. l., to Rantoul, 42 miles.	6	42 75	24.125 m. from Feb. 20, 1879; 125 m. decrease.	291
3337	2547	5884	3246	108	3.11 by 3.5, f. f., s. l.	6	42 75	26 m. from Dec. 1, 1878. In May, 1879.	292
3055	2342	5397	3254	108	no apt.; no r. a.	6	42 75	.17 m. increase	293
2651	1945	4596	3213	107	in b. c.; no r. a.	6	42 75	In June, 1879	294
2612	1601	4213	3131	104	16.3 by 7.2, f. f.; no r. a.	12	42 75	In May, 1879	295
3607	2427	6034	3100	103	in b. c.; no r. a.	6	42 75		296
1975	1389	3364	3014	100	no apt.; no r. a.	18	42 75	In May, 1879	297
1068	1875	2943	2943	98	no apt.; no r. a.	12	42 75	2.01 m. increase	298
2076	806	2972	2972	98	in b. c.; no r. a.	6	42 75	In May, 1879	299

E.—Table showing the weight of the mails, the speed with which they are

Order.	State.	Number of route.	New number of route.	Termini.	Corporate title of company carrying the mail.	Length of route. Miles.	Miles per hour.
300	Iowa	27042		Chariton, Indianola	Chicago, Burlington and Quincy	34.67	16
301	Pa	8121		Olean, Bradford	Olean, Bradford and Warren	22.83	13
302	Iowa	27039		Turkey River, Wadena	Chicago, Clinton, Dubuque and Minnesota	44.98	10
303	Mich	24042	24032	Powers, Quinnesec	Chicago and Northwestern (operating Menominee R. R.).	25.09	13
304	Iowa	27045		Avoca, Harlan	Chicago, Rock Island and Pacific	12.40	14
305	Miss	18010		Natchez, Martin	Natchez, Jackson and Colum bus	43.09	17
306	Ala	17004		Wetumpka, Elmore	South and North Alabama	6.81	15
307	Iowa	27035		Burlington, Winfield	Burlington and Northwestern	34.34	14
308	Mo	28016		Pleasant Hill, De Soto Junction.	Atchison, Topeka and Santa Fé	46.8	10
309	Ill	23006		Kansas, Westfield	Danville, Olney and Ohio River	8.28	13
310	Iowa	27046		Adell, Waukegan	Des Moines, Adell and Western	7.50	14
311	Ind	22038		Monticello, Rensselaer	Indianapolis, Delphi and Chicago	26.82	16
312	Iowa	27041		Creston, Fontanelle	Chicago, Burlington and Quincy	31.42	16
313	Iowa	27010		Albia, Eddyville Junction	Central, of Iowa	14.84	8
314	Cal	46030		Monterey, Salinas	Monterey and Salinas Valley	21	15
315	Texas	31017		Denison, Whitwright	Missouri, Kansas and Texas	21.23	12
316	Mo	28031		Saint Louis, Florissant	West End Narrow Gauge	19	16
317	Pa	8118		Latrobe, Ligonier	Ligonier Valley	11.04	15
318	Pa	8120		Salisbury Junction (n. o.), Elk Lick	Salisbury	7.43	20
319	Utah	41006		Sandy, Alta	Wasatch and Jordan Valley	16.78	8
320	Ill	23019		Varna, Lacon	Chicago and Alton	10.55	20
321	Wis	25031	25022	New Lisbon, Necedah	Chicago, Milwaukee and Saint Paul	12.76	16
322	Va	11019		Sutherlin, Milton	Milton and Sutherlin Narrow Gauge	7	8
323	Texas	31018		Brownsville, Brazos Santiago	Rio Grande	38.04	21
324	Colo	38008		Boulder, Marshall	Golden, Boulder and Caribou	6.75	8
325	Ky	20023		Mount Sterling, Rothwell	Mount Sterling Coal Railroad	10.21	8
326	Mo	28035		New Madrid, Malden	Little River Valley and Arkansas	27.10	14
327	Mich	24015		Otter Lake Junction, Otter Lake	Flint and Pere Marquette	14.53	12
328	Minn	26004		East Saint Cloud, Alexandria	Saint Paul, Minneapolis and Manitoba	62.5	14
329	Iowa	27025		Calmar, Pattersonville	Chicago, Milwaukee and Saint Paul	224.46	14
330	Mich	24038	24019	Walton, Petoskey	Grand Rapids and Indiana	71.81	19
331	Mich	24040	24041	Saint Louis, Edmore	John A. Elwell (Jesse Chicago, Saginaw and Canada)	23.39	17.65
332	Ill	23054		Chicago, Byron	Chicago and Pacific	88.85	18
333	Ill	23039		Carbondale, Grand Tower	Grand Tower Mining, Manufacturing and Transportation Company	25.32	14
334	Mo	28029		Hannibal, Prairieville	Saint Louis, Hannibal and Keokuk	47.00	16
335	Ill	23029		White Heath, Decatur	Indianapolis, Bloomington and Western	33.15	15

conveyed, the accommodations for mails and agents, &c.—Continued.

Whole weight carried any distance for thirty days.			Average weight carried whole distance.		Size, &c., of mail-car or apartment.	Trips per week.	Pay per mile per annum.	Remarks.	Order.
Outward.	Inward.	Total.	30 days, total.	Per day, total.					
Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Feet and inches.		Dolls		
2011	2090	4710	2870	95	no apt.; no r. a.	9	42 75	19.58 m. from Mar. 15, 1879; .58 m. increase.	300
2431	3198	5569	2707	90	in b. c.; no r. a.	6	43 75	In May, 1879.	301
2804	1912	4716	2608	86	7.1 by 7.7, f. f.; no r. a.	6	42 75	.93 m. increase.	302
2298	2027	4325	2582	86	no apt.; no r. a.	6	42 75	.41 m. increase.	303
1681	865	2546	2546	84	no apt.; no r. a.	6	42 75	2.49 m. decrease.	304
2602	2305	4907	2454	81	no apt.; no r. a.	6	42 75	8.77 m. from Mar. 1, 1879. In May, 1879.	305
632	1287	1919	1919	63	mails in chest.	7	42 75	Branch; main route, \$84.134 (). In Mar., 1879.	306
1368	820	2188	1812	60	no apt.; no r. a.	6	42 75	18.82 m. only paid for as per agreement with company; .22 m. decrease.	307
2160	1832	3492	1825	60	in charge of conductor	6	42 75	No service 164 m. Morse to De Soto Junction.	308
1341	434	1775	1775	59	no apt.; no r. a.	6	42 75	.....	309
820	942	1762	1762	58	no apt.; no r. a.	12	42 75	.16 m. increase.	310
1747	1254	3001	1723	57	6.6 by 6.7, f. f., a. l.	6	42 75	10.40 m. from Sept. 2, 1878. In Mar., 1879.	311
1221	894	2115	1586	52	no apt.; no r. a.	6	42 75	6.80 m. yet to weigh. .72 m. increase.	312
1156	1009	2255	1470	49	in b. c.; no r. a.	6	42 75	Branch; main route, \$56.43 (117). Title reported "Central Iowa Railway."	313
524	950	1474	1474	49	in b. c.	7	42 75	In July, 1879.	314
1240	942	2182	1375	45	in b. c.; no r. a.	6	42 75	In May, 1879.	315
1261	1045	2306	1286	42	in b. c.; no r. a.	6	42 75	8.47 m. from Oct. 6, 1878.	316
902	869	1271	1271	42	mail in locked closet.	6	42 75	In November, 1878.	317
724	485	1209	1209	40	in b. c.; no r. a.	12	42 75	In May, 1879.	318
720	427	1147	1147	38	no apt.; no r. a.	6	42 75	.....do	319
512	601	1113	1113	37	in b. c.; no r. a.	6	42 75	Branch; main route, \$42.75 (270).	320
752	387	1139	1139	37	in b. c.; no r. a.	6	42 75	.....	321
663	289	952	952	31	in b. c.; no r. a.	6	42 75	In May, 1879.	322
444	404	848	848	28	in passenger car.	7	42 75	In May, 1879.	323
219	179	398	398	13	cab of locomotive.	6	42 75	In April, 1879.	324
419	872	1291	1228	40	in passenger car.	7	40 50	In Oct., 1878. Intermediate office supplied 3 times a week.	325
203	214	417	417	13	7 by 6.6 f. f.; no r. a.	6	40 50	.....	326
2125	1612	3737	2180	72	no apt.; no r. a.	6	40 00	Branch; main route, \$98, \$66.664 (—).	327
8312	3773	12085	6425	214	11 by 8.4, f. f., a. l.	6	39 50	33.5 m. from Jan. 1, 1879.	328
26345	30025	47270	26389	679	19.6 by 9.2, f. f., a. l.	6	38 98½	98.30 m. from Jan. 1, 1879; 1.64 m. decrease.	329
13936	7763	21699	16383	546	13 by 7, f. f., a. l.	6	38 98½	.05 m. decrease.	330
5097	4047	9144	6976	232	12 by 8, f. f., a. l.	9*	38 47½	.....	331
10509	7238	17747	6705	223	10.6 by 6.10, f. f., a. l.	6	38 47½	2.01 m. decrease.	332
3466	2195	5661	3648	121	in locked chest.	12	38 47½	.32 m. increase.	333
3752	3145	6897	3413	113	no apt.; no r. a.	6	38 47½	14.60 m. from Aug. 1, 1878.	334
3235	2872	6107	3367	112	no apt.; no r. a.	6	38 47½	Branch; main route, \$42.75 (229); .80 m. increase.	335

E.—Table showing the weight of the mails, the speed with which they

Order.	State.	Number of route.	New number of route.	Terminal.	Corporate title of company carrying the mail.	Length of route.	Miles per hour.
336	Iowa	27040	.....	Adams, Waukon.....	Waukon and Mississippi Railroad Guarantee Company.	<i>Miles.</i> 22.92	11
337	Ill	23046	.....	Jacksonville, Virden.....	Jacksonville, Northwestern and Southeastern.	31.08	13
338	S. C.	14003	.....	Kingsville, Camden.....	South Carolina.....	33.25	13
339	Del	9505	.....	Wilmington, Pomeroy.....	Delaware Western.....	33.85	13
340	Iowa	27036	.....	Newton, Monroe.....	Newton and Monroe.....	17.50	15
341	Iowa	27037	.....	Judd, Lehigh.....	Crooked Creek Railway and Coal Company.	8.5	12
342	Minn	28002	28006	Saint Paul, Breckenridge...	Saint Paul, Minneapolis and Manitoba.	217.06	18
343	Kans	33015	33019	Ottawa, Williamsburgh.....	Kansas City, Burlington and Santa Fé.	17.38	15
344	N. C.	13012	.....	Jamesville, Washington.....	Jamesville and Washington...	22.51	20
345	Ala	17015	.....	Chattanooga, Meridian.....	Alabama and Chattanooga....	295	20
346	Iowa	27005	.....	Pacific Junction, East Plattsmouth.	Chicago, Burlington and Quincy.	5.06	14
347	Mo	28005	.....	Palmyra, Hannibal.....	Hannibal and Saint Joe.....	15	24
348	Minn	28019	.....	Worthington, Sioux Falls...	Worthington and Sioux Falls.	63.05	18
349	Pa.	8095	.....	Pittsburgh, Castle Shannon.	Pittsburgh and Castle Shannon	7	12
350	Minn	28017	28024	Mankato, Wells.....	Central of Minnesota.....	40.81	21
351	Ill	23042	.....	Bismarck, Snoddy's Mills...	Chicago and Eastern Illinois..	24.35	13
352	Minn	28020	28005	Crookston, Fisher's Landing.	Saint Paul, Minneapolis and Manitoba.	12.10	15
353	Mich	24041	24040	Humboldt, Republic.....	Marquette, Houghton and Ontonagon.	9.70	18
354	S. C.	14013	.....	Chester, C. H., Cedar Shoals.	Cheraw and Chester Narrow Gauge.	18.50	13
355	Mo	28023	.....	Cuba, Salem.....	Saint Louis, Salem and Little Rock.	40.98	19
356	Minn	28010	.....	Hastings, Montevideo.....	Chicago, Milwaukee and Saint Paul.	157.28	12
357	Minn	25014	28027	Stillwater, Stillwater Junction.	Saint Paul, Stillwater and Taylor Falls.	3.25	.....

are conveyed, the accommodations for mails and agents, &c.—Continued.

Whole weight carried any distance for thirty days.			Average weight carried whole distance.		Size, &c., of mail-car or apartment	Trips per week.	Pay per mile per annum.	Remarks.	Order.
Outward.	Inward.	Total.	30 days, total.	Per day, total.					
Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Feet and inches.		Dolls.		
2110	1344	3454	2898	96	no apt; no r. a.	12	38 47½	.06 m. increase.	336
2862	2481	5343	2838	94	7 by 6.6, f. f., a. l.	6	38 47½	.29 m. increase.	337
2122	1102	3224	2517	83	in b. c.; no r. a.	6	38 47½	Branch; main route, \$59.85 (107). In Apr., 1879.	338
2619	2637	5256	1579	52	7.5 by 6.10, f. f., a. l.	6	38 47½	19.32 m. from Feb. 10, 1879. In May, 1879.	339
939	920	1859	1318	43	in b. c.; no r. a.	6	38 47½	.40 m. decrease.	340
569	223	792	786	26	no apt; no r. a.	6	38 47½		341
4597	2412	6999	3640	1321	17.9 by 8.5 (av.), f. f., a. l.	10½	38 30½	.67 m. increase.	342
1912	1068	2980	2844	94	in b. c.; no r. a.	6	36 00		343
420	769	1189	760	25	in passenger car	6	36 00	In Dec., 1878.	344
27488	20248	47731	16696	556	11.10 by 7.2, f. f., a. l.	7	34 20	24.5 m., at \$42.75. In July, 1879.	345
14519	1918	16437	16437	547	no apt; no r. a.	12	34 20	Branch; main route, \$183.64 (20); 1.06 m. increase.	346
3638	5720	9358	9358	311	in b. c.	7	34 20	Branch; main route, \$172.06 (24.)	347
7777	4006	11843	7993	266	12 by 8.8, f. f., a. l.	6	34 20	29.55 m. from Aug. 1, 1878. In Dec., 1878.	348
3029	1854	4883	4189	139	in b. c.; no r. a.	6	34 20	In Sept., 1878.	349
2870	2565	5435	2724	90	8.1 by 7.1, f. f., a. l.	6	34 20	.25 m. decrease.	350
1106	618	1719	1062	35	in b. c.; no r. a.	6	34 20	Branch; main route, \$64.12½ (96); .05 m. increase.	351
459	895	854	854	28	in b. c.; no r. a.	6	34 20	Branch; main route, \$66.96 (90); .01 m. increase.	352
567	239	806	806	26	no apt; no r. a.	6	34 20	Branch; main route, \$45.82½ (100).	353
1335	763	2098	1707	56	in locked box	3	29 92	In Feb., 1879.	354
4742	4054	8796	5741	191	10 by 6.6, f. f., ½ l.	3	28 60	.10 m. increase.	355
22384	10113	32497	11898	396	18.6 by 9.2, f. f., a. l.	6	27 36	82.40 m. from Jan. 1, 1879; .96 m. increase.	356
1588	2025	3613	3613	120	no apt; in charge of baggage-master.	15	25 65	Late part of route 25030.	357

F.—Table showing the readjustment of the rates of pay per mile on railroad routes in States and on certain new routes the adjustment of the rates, based upon returns of the weight of and the number of trips per week, in accordance with the act of March 3, 1873; and with after July 1, 1876.

[ABBREVIATIONS.—f. f., fixtures and furniture; f. f. c., fixtures and furniture complete; r. p. o., railway triple line; q. l., quadruple line; m., miles; r. a., route-agents; m. m., mail-messenger. A number following "column" refer to the order of the routes in this table.]

Order.	State.	Number of route.	New number of route.	Termini.	Corporate title of company carrying the mail.	Length of route.	Average weight of mails whole distance per day.	Miles per hour.	Size, &c., of mail-car or apartment.
						Miles.	Lbs.		Feet and inches.
1	Ill	23031		East Saint Louis, Terre Haute.	Terre Haute and Indianapolis.	163.69	21,679	27	r. p. o., 60.94 by 8.74, f. f. c., d. l.; r. a. apt., 19.2 by 7, f. f. a. l.
2	Ill	23007		Chicago, Aurora ...	Chicago, Burlington and Quincy.	38.61	16,676	23	r. p. o., 54.8 by 8.6, c. d. l.; 25.11 by 8.104, f. f. c., a. l.
3	Ill	23007		Aurora, Burlington	Chicago, Burlington and Quincy.	169.41	16,676	23	r. p. o., 54.8 by 8.6, c. d. l.; 25.11 by 8.104, f. f. c., a. l.
4	Ill	23085		Chicago, Milwaukee.	Chicago, Milwaukee and Saint Paul.	88.28	15,978	28	r. p. o., 50 by —, f. f. c., d. l. (40 feet cars authorized).
5	Mo	28001		Saint Louis, Atchison.	Missouri Pacific	329.75	15,871	25	r. p. o., 50 by 8.7, c. d. l. to Arkansas City 33 m.; a. l. residue.
6	Mass	3001		Boston, Portsmouth	Eastern	57.28	15,881	25	r. p. o., 42 by 8.7, f. f. c., d. l.; r. a. apt., 20 by 8.7, f. f. a. l.
7	Ill	22015		Chicago, Davenport	Chicago, Rock Island and Pacific.	182.92	14,745	23	r. p. o., 50 by 8.6, c. d. l.; 42 by 8.6, f. f. c., d. l.
8	Me	9		Portland, Portsmouth.	Eastern	52.56	14,080	23	r. p. o., 43 by 8.7, f. f. c., d. l.; apt., 20 by 8.7, f. f. a. l.
9	Ill	23003		Chicago, Cedar Rapids.	Chicago and Northwestern.	219	12,314	23	r. p. o., 35 by 8.4, f. l.; 50 by 8.4, f. f. c.
10	Wis ...	25002	25002	Milwaukee, La Crosse.	Chicago, Milwaukee and Saint Paul.	197.84	11,324	23	r. p. o., 50 by —, f. f. c., d. l. (40 feet cars authorized).
11	Ill	22003		Cedar Rapids, Union Pacific Transfer.	Chicago and Northwestern.	272.18	12,314	22	r. p. o., 35 by 8.4, f. l., f. f. c.
12	Iowa ..	27014		Davenport, Missouri River.	Chicago, Rock Island and Pacific.	317.40	12,034	22	r. p. o., 50 by 8.6, c. d. l. to Iowa City, 54.50 m.; a. l. residue.
12*	Mich ..	24006	24006	Detroit, Chicago...	Michigan Central	266.09	6194	25½	r. p. o., 44 by 8.2, f. f. c., a. l.; r. a. apt. (av.), 11.5 by 8; f. f. a. l. to Wayne Junction, 18 m.; d. l. thence to Jackson, 57.7 m.; a. l. between Niles and Chicago, 84 m.

and Territories in which the contract-term expired June 30, 1879, and also in other States, the mails, the speed with which they are conveyed, the accommodations for mails and agents, the acts of July 12, 1876, and June 17, 1878, in the case of readjustments taking effect on and

post-office; apt., apartment; b. c., baggage-car; l., line or lines; a l., single line; d. l., double line; & l., lowed by an asterisk (*) shows the equivalent in round trips. The figures in parentheses in the "Re-

Trips per week.	Pay per mile for r. p. o. cars.	Pay per mile for transportation.	Former pay per mile per annum.	Amount of annual pay.	Former amount of annual pay.	Date of readjustment or adjustment.	Remarks.	Order.
23. 7*	Dolls. 100 00	Dolls. 348 84	Dolls. 399 25	Dolls. 74, 817 13	Dolls. 65, 035 95	July 1, 1879	1.29 m. increase	1
22. 6*	102 50	394 98	332 00	15, 346 70	12, 844 16	July 1, 1879	Part; residue \$294.98, wt., \$80, r. p. o. Main route; branches, \$42.75, \$49.59. 1.13 m. increase on whole route.	2
22. 6*	80 00	394 98	310 19	63, 534 36	52, 198 77	July 1, 1879	Part; residue \$294.98, wt., r. p. o., \$102.50. Main route; branches, \$42.75, \$49.59. Former distance 168.28 m. 1.13 m. increase on whole route.	3
17. 7*	50 00	288 14	250 00	23, 834 09	22, 057 80	July 1, 1879	.....	4
14. 4*	80 00	286 43	323 67½	116, 800 56	103, 018 64	July 1, 1879	37 m., formerly at \$274.94; 47.75 m., formerly at \$283.67½. 37 m., at \$229.14, wt.; 47.75 m., at \$40, r. p. o.	5
24	50 00	277 88	276 31½	18, 800 96	15, 827 32	July 1, 1879	In May, 1879	6
15. 29*	65 00	274 48	301 87	63, 094 02	55, 639 15	July 1, 1879	24 m., formerly at \$326.37. m. increase.	7
24	50 00	267 62	251 78	16, 694 10	13, 233 55	July 1, 1879	In May, 1879	8
12. 49*	61 87	248 81	289 87	68, 038 92	63, 069 91	July 1, 1879	Part; residue \$199.05, wt., \$21.87, r. p. o. (11). Former distance 217.58 m. 1 m. increase on whole route.	9
13	50 00	238 55	269 00	57, 086 73	44, 914 79	July 1, 1879	61.60 m., formerly at \$199.79½; 16.80 m., formerly at \$269; 25.76 m., formerly at \$219. 2.80 m. increase.	10
12. 49*	21 87	199 05	191 21½	60, 129 99	52, 124 39	July 1, 1879	Part; residue \$248.81, wt., \$61.87, r. p. o. (9). Former distance 272.6 m. 1 m. increase on whole route.	11
12	25 00	196 31	192 50	72, 173 79	62, 590 44	July 1, 1879	54 m., formerly at \$217.58; 54.5 m., at \$196.31, wt.; \$65, r. p. o. .60 m. decrease.	12
16. 55*	25 00	192 60	223 00	68, 010 18	63, 425 66	July 1, 1879	75.7 m. at \$202.60 wt. \$25 r. p. 12m o. 1.67 m. increase.	

F.—Table showing the readjustment of the rates of pay per mile on railroad routes in

Order.	State.	Number of route.	New number of route.	Termini.	Corporate title of company carrying the mail.	Length of route.	Average weight of mails which distance per day.	Miles per hour.	Size, &c., of mail-car or apartment.
						Miles.	Lbs.		Feet and inches.
13	N. H.	1601		Concord, Nashua...	Concord	36.28	5,546	23	r. p. o., 32.4 by 7.8 (average), 7 f., d. l.; r. a. apt., 16.9 by 6.8; 13 by 7, d. l. to Manchester, 18 m.
14	Ill.	23010		Galesburg, Quincy.	Chicago, Burlington, and Quincy.	101.57	5,431	25	r. p. o., 44.4 by 9.1, f. f. c., d. l.
15	Minn.	23013	23013	Minneapolis, La Crosse.	Chicago, Milwaukee, and Saint Paul.	146.54	5,330	22	r. p. o., 40 by—f. f. c., a. l.
16	Mich.	24035	24035	Toledo, Detroit	Toledo, Canada Southern, and Detroit.	61.32	4,462	23	16 by 9.3, f. f., a. l. to Slocum Junction, 44 m.; d. l. residue, 17.32 m.
17	Mo.	28011		Sedalia, Denison...	Missouri, Kansas, and Texas.	447.42	5,032	21	r. p. o., 50.4 by 9.7 f. c., a. l. (40 f. authorized); r. a. apt., 16.8 by 9.2, f. f., a. l.
18	Ind.	22010		Cincinnati, Saint Louis.	Ohio and Mississippi...	341	4,887	30	r. p. o., 49.6 by 9.3; 44.6 by 9.3, f. f. c., a. l. (average 47 by 9.3).
19	Ill.	23001		Chicago, Milwaukee, Falls.	Chicago and Northwestern.	85.37	4,618	27	r. p. o., 35.4 by 9, f. f., d. l.
20	Mass.	3011		Boston, Salmon Falls.	Boston and Maine.....	71.50	4,598	27	r. p. o., 25 by 8.4 f. f. c., d. l.; r. a. apt., 14.4 by 8.16 (average), 1 f.; a. l. bet. Boston and Lawrence.
21	Iowa.	27605		Burlington, Union Pacific Transfer.	Chicago, Burlington and Quincy.	293.14	8,241	23	r. p. o., 51 by 8.8 f. f. c., a. l.
22	Ill.	23023		Decatur, East Saint Louis.	Wabash	112	4,280	28	20 by 9.4, f. f., a. l.
23	Maine.	12		Bangor, Vanceborough.	European and North American.	113.98	3,367	19	r. p. o., 21 by 8.4 f. f. c., a. l.
24	Mo.	28010		Kansas City, Cameron.	Hannibal and Saint Joseph.	54	3,604	24	r. p. o., 40.1 by 9.1, f. f. c., a. l.
25	Mo.	28006		Kansas City, Union Pacific Transfer.	Kansas City, Saint Joseph and Council Bluffs.	203.5	3,574	22	39.1 by 9.1, f. f., a. l.
26	Ill.	23017		Chicago, East Saint Louis.	Chicago and Alton.....	282.36	3,212	25	r. p. o., 44.4 by 8.1, f. f. c., a. l.; r. p. o., 25.7 by 8.16 f. f. c., a. l. bet. Pontiac and Bloomington, 24.6 m.
27	Mo.	28005		Quincy, Saint Joseph.	Hannibal and Saint Joseph.	203.5	5,806	24	r. p. o., 40, by 9.1, f. f. c., a. l. to Cameron, 17 m.
28	Ill.	23020		Chicago, Cairo	Illinois Central	363.32	5,658	22	r. p. o., 44.4 by 8, 41.5 by 8.2, 49.4 by 9, 48.4 by 9, f. f. c.; q. l. to Kankakee, 55.87 m.; d. l. thence to Telemo, 81.17 m.; a. l. residue.
29	Mo.	28014		Hannibal, Sedalia...	Missouri, Kansas and Texas.	142.88	2,840	21	r. p. o., 50.4 by 9, f. f. c., a. l.
30	La.	30001		New Orleans, Canton.	New Orleans, Saint Louis and Chicago.	208.10	3,870	25	25 by 9, f. f., a. l.
31	Wis.	25006	25006	Chicago, Green Bay	Chicago and Northwestern.	242.50	2,781	23	r. p. o., 50 by 10, f. f. c., a. l.
32	Maine.	11		Salmon Falls, Portland.	Boston and Maine.....	45	2,646	35	r. p. o., 25 by 8.4 f. f. c., d. l.

States and Territories in which the contract-term expired June 30, 1879, &c.—Continued.

Trip	week.	Pay per mile for r. p. o. cars.	Pay per mile for transportation.	Former pay per mile per annum.	Amount of annual pay.	Former amount of annual pay.	Date of readjust- ment or adjust- ment.	Remarks.	Order.
34. 5*		Dolls. 40 00	Dolls. 181 13	Dolls. 229 65	Dolls. 8, 022 59	Dolls. 8, 331 70	July 1, 1878	30 days in August, 1878, and 30 days in April, 1877, combined.	13
12		50 00	175 28	169 49½	22, 881 68	16, 949 50	July 1, 1879	1.57 m. increase	14
12. 6*		25 00	174 42	180 61	28, 999 76	19, 594 34	July 1, 1879	6.4 m., formerly at \$63.61½; 8.85 m., formerly at \$79.51½; 103.84 m., formerly at \$178; 6.4 m., at \$139.54, wt., \$25, r. p. o. 1.30 m. decrease.	15
18. 6*		173 31	92 00	10, 187 36	5, 361 08	July 1, 1879	Formerly 17.32 m., at \$102; 44 m., at \$163.31. 4.93 m. increase.	16
12. 37*		25 00	171 00	172 91½	86, 390 62	76, 670 43	July 1, 1879	23.50 m., formerly at \$143.33½; 12.5 m., at \$136.80.	17
13		30 00	169 29	206 00	67, 957 89	69, 646 00	Dec. 1, 1878	In November and December, 1878.	18
12		44 00	165 02	232 00	17, 844 03	19, 926 48	July 1, 1879	.52 m. decrease	19
24		33 32	165 02	185 61	14, 181 31	.....	July 1, 1879	Main route; branch, \$42.75. In May, 1879.	20
12		40 00	164 16	183 64	59, 847 46	53, 833 22	July 1, 1879	Main route; branches, \$52.67, \$65.84 (114,160).	21
15		159 89	187 00	17, 907 68	20, 944 00	July 1, 1879	.....	22
12		12 50	159 30	158 30	19, 573 17	18, 035 11	May 1, 1878	In May, 1878	23
13		25 00	150 48	239 00	9, 475 92	13, 636 00	July 1, 1879	\$780 formerly for ferrriage	24
13. 48*		150 48	141 07½	30, 622 68	28, 708 76	July 1, 1879	.....	25
16. 17*		25 00	145 35	185 61	48, 640 47	52, 408 84	July 1, 1879	34.6 m., at \$145.35, wt., \$40.62, r. p. o.	26
13		25 00	143 64	172 06	33, 505 75	34, 201 71	July 1, 1879	32.5 m. formerly, at \$147.06; r. p. o. on 171 only. Main route; branch, \$40.36 (312).	27
15. 9*		115 00	142 28	219 70	67, 833 71	58, 847 29	July 1, 1879	226.61 m. formerly, at \$144.70; 81.17 m., at \$142.28, wt., \$50 r. p. o.; 226.28 m., at \$142.28, wt., \$25, r. p. o.; .57 m. decrease.	28
12		25 00	140 22	150 68½	23, 806 63	21, 569 27	July 1, 1879	.....	29
7		146 22	140 40	29, 179 78	28, 922 40	July 1, 1878	2.10 m. increase. In April, 1878.	30
12. 13*		40 00	139 37	230 00	41, 643 87	51, 943 34	July 1, 1879	66.50 m. formerly, at \$169.96; 66.50 m., at \$111.50, wt., \$40, r. p. o.; .70 m. decrease.	31
15*		23 32	133 40	165 09	7, 502 40	7, 429 05	July 1, 1879	In May, 1879	32

F.—Table showing the readjustment of the rates of pay per mile on railroad routes in

Order.	State.	Number of route.	New number of route.	Termini.	Corporate title of company carrying the mail.	Length of route.	Average weight of mails whole distance per day.	Miles per hour.	Size, &c., of mail-car or apartment.
						Miles.	Lbs.		Feet and inches.
33	Mass	3063		Lawrence, Manchester.	Manchester and Lawrence.	27.06	1,860	24	16.9 by 6.8, 12 by 7, f. f., d. l.
34	N. H.	1005		Concord, Wells River.	Boston, Concord and Montreal.	94.01	1,858	29	16.9 by 6.8, f. f., d. l. to Plymouth, 51 m.; a. l. residue.
35	Tex.	31003		Houston, Denison City.	Houston and Texas Central.	337.45	2,120	20	14 by 7.3, f. f., a. l.
36	Wis	25001	35901	Milwaukee, North McGregor.	Chicago, Milwaukee and Saint Paul.	197.14	2,107	22	19.6 by 9.2, f. f., a. l.
37	N. Y.	6036		Rome, Ogdensburg.	Rome, Watertown and Ogdensburg.	142	1,982	25	25 by 7.4, f. f., a. l.
38	Mich	24007	24028	Detroit, Port Huron.	Grand Trunk of Canada.	64.85	1,960	22	24 by 6, f. f., a. l.
39	Wis	25013	25012	Milwaukee, Fond du Lac.	Chicago and Northwestern.	63.53	1,960	23	12.6 by 7.6, f. f., a. l.
40	Cal	46003		Roseville, Redding.	Central Pacific.	151.45	1,917	20	23.6 by 8.10, f. f., a. l.
41	Mich	24006	24027	Detroit, Grand Haven.	Detroit, Grand Haven and Milwaukee.	191.15	1,907	25	22 by 9.2 (average)
42	Ill	23030		East Saint Louis and Duquoin.	Saint Louis, Alton and Terre Haute.	71.27	1,824	24	18 by 7.6, f. f., a. l.
43	Wis	25012	25014	Winona, Winona Junction.	La Crosse, Trempealeau and Prescott.	30.83	1,703	20	15.3 by 7.6, f. f., a. l.
44	Ill	23009		Peoria, Galesburg.	Chicago, Burlington and Quincy.	54.85	1,478	27	15.11 by 8.9, f. f., a. l. to Elmwood, 28.59 m.; d. l. residue, 26.26 m.
45	Iowa	27029		Missouri Valley, Sioux City.	Sioux City and Pacific.	76.18	1,610	22	17.4 by 9, f. f., a. l.
46	Tex.	31002		Harrisburg, San Antonio.	Galveston, Harrisburg and San Antonio.	215	1,436		11.5 by 8.5 (average), f. f., a. l.
47	S. C.	14003		Brineville, Charleston.	South Carolina.	62.25	1,149	29	16.6 by 8.4, f. f., d. l.
48	Ill	23025		Hannibal, Maples.	Wabash.	45.50	1,363	25	12 by 9.10, f. f., a. l.
49	Mo	28022		Road House, Mexico.	Chicago and Alton.	90	1,328	26	r. p. o., 25.7 by 8.10, f. f., a. l. r. a. apt., 19.6 by 9.2, f. f., a. l.
50	Wis	25016	25016	Milwaukee, Green Bay.	Wisconsin Central.	114.53	1,324	27	7.7 by 6.10, f. f., a. l. to Hilbert, 66.1 m.; not a residue.
51	Oreg.	44001		Portland, Roseburg.	Oregon and California.	199.10	1,322	18	20 by 9, f. f., a. l.
52	Ill	23031		Dubuque, Centralia.	Illinois Central.	346.93	1,892	18	r. p. o., 35.4 by 8.10, 35.8 by 9.5, f. f., a. l. to Freeport, 65.80 m.; a. l. thence to Foreston, 12.51 m.; r. a. apt., 27.3 by 9, f. f., a. l. to Freeport and Centralia, 278.10 m.
53	Mich	24013	24013	Detroit, Bay City.	Detroit and Bay City.	108.62	1,300	19	14.4 by 9, f. f., a. l.
54	Iowa	27021		Dubuque, Sioux City.	Illinois Central.	329.61	1,820	21	21.5 by 8.11 (average), f. f., a. l.
55	Kansas	33008	33006	Kansas City, Ottawa.	Kansas City, Lawrence and Southern.	55.49	1,235	25	18 by 8.9, f. f., a. l.
56	Wis	25016	25010	Caledonia Station, Winona Junction.	Chicago and Northwestern.	190.02	1,217	10	36 by 9.6, f. f., a. l.
57	Kansas	33005	33005	Kansas City, Baxter Springs.	Missouri River, Fort Scott and Gulf.	154.79	1,195	25	18 by 8.9, f. f., a. l.
58	Mich	24010	24010	Jackson, Rapids.	Grand Michigan Central.	94.46	1,191	21	11 by 7.10, 10 by 8.8, f. f., a. l.
59	Minn	26009	26009	Mendota, McGregor.	Chicago, Milwaukee and Saint Paul.	207.96	1,182	19	23.6 by 9.2, f. f., a. l.

States and Territories in which the contract-term expired June 30, 1879, &c.—Continued.

Trips per week.	Pay per mile for r. p. o. cars.	Pay per mile for transportation.	Former pay per mile per annum.	Amount of annual pay.	Former amount of annual pay.	Date of readjustment or adjustment.	Remarks.	Order.
	<i>Dolla.</i>	<i>Dolla.</i>	<i>Dolla.</i>	<i>Dolla.</i>	<i>Dolla.</i>			
18	183 27	133 30	3,579 22	3,607 09	July 1, 1878	Combined returns, Aug., 1878, and April, 1877.		33
18	131 41	127 90	11,923 75	11,593 77	July 1, 1878	43.01 m. formerly, at \$117.90; 43.01 m., at \$121.41. Combined returns, Aug., 1878, and April, 1877.		34
18	129 96	120 55	43,855 00	40,679 56	Dec. 1, 1878	Combined weighings for April and December, 1878.		35
13. 9*	129 11	125 00	25,453 74	24,650 00	July 1, 1879	.06 m. decrease		36
18	127 39	132 52½	18,089 38	18,818 55	Mar. 1, 1879	Main route; branch, \$64.98 (123). In March, 1879.		37
15. 5*	126 54	105 30	8,306 11	6,791 85	July 1, 1879	.35 m. increase		38
12	126 54	68 00	8,039 08	4,320 04	July 1, 1879			39
7. 25*	123 98	121 50	18,776 77	18,401 17	July 1, 1878	In Aug., 1878		40
20. 2*	123 98	98 32½	23,698 77	18,649 30	July 1, 1879	1.48 m. increase		41
15. 4*	120 56	119 00	8,592 31	8,544 20	July 1, 1879	.53 m. decrease		42
12	115 43	170 00	3,558 70	5,176 50	July 1, 1879	.38 m. increase		43
14. 9*	115 17	128 25	6,031 17	6,925 50	July 1, 1879	28.59 m., at \$105.17; .85 m. increase.		44
12	111 15	90 63	8,467 40	6,887 88	July 1, 1879	Main route; branch, \$54.72 (147); .18 m. increase.		45
12	103 45	94 91	22,241 75	24,405 65	Mar. 1, 1879	Combined weighings of April, 1878, and March, 1879.		46
25	101 48	64 98	6,317 18	4,045 00	July 1, 1879	Branch; main route, \$67.55 (105). In April, 1879.		47
12	100 89	131 00	4,590 49	5,900 50	July 1, 1879	Main route; branch, \$42.75 (242).		48
18	16 00	98 18	10,906 20	11,148 75	July 1, 1879			49
12	90 18	58 14	11,359 08	6,484 93	July 1, 1879	Main route; branch, \$87.21 (66); 2.99 m. increase.		50
6	90 18	94 91	19,746 73	18,896 56	Aug. 16, 1878	In Aug., 1878.		51
12	44 00	98 50	37,475 02	39,896 36	July 1, 1879	67.67 m. formerly, at \$146.88½; 12.53 miles formerly, at \$129.88½; 12.51 m., at \$98.50, wt., \$22, r. p. o.; 2.93 m. increase.		52
18	98 82	85 00	10,679 50	9,262 45	July 1, 1879	1.35 m. decrease		53
12	96 45	85 50	31,790 88	27,968 76	July 1, 1879	2.49 m. increase		54
6	94 91	96 30	5,266 55	5,341 68	July 1, 1878	Route curtailed, to begin at Olathe, from March 1, 1879. In April, 1878.		55
12	94 05	132 00	17,871 38	21,722 40	July 1, 1879	54.90 m. formerly, at \$70; 33 m. decrease.		56
10. 37*	93 20	90 72	14,426 42	14,533 34	July 1, 1878	5.41 m. decrease. From March 1, 1879, pay increased \$7.69 per mile. In April, 1878.		57
19	98 20	90 00	8,808 67	8,587 40	July 1, 1879	0.40 m. decrease		58
10. 06*	93 20	95 00	17,801 75	17,408 60	July 1, 1879	95.5 m. formerly, at \$64.98; 95.5 m., at \$74.56; .74 m. decrease.		59

F.—Table showing the readjustment of the rates of pay per mile on railroad routes in

Order.	State.	Number of route.	New number of route.	Termini.	Corporate title of company carrying the mail.	Length of route.	Average weight of mails whole distance per day.	Miles per hour.	Size, &c., of mail-car or apartment.
						Miles.	Lbs.		Feet and inches.
60	N. H.	1006		Groveton, Wells River.	Boston, Concord and Montreal.	54.12	830	28	16.9 by 6.8, 13.6 by 6.7, 9.11 by 6.9, f. f., a. l. to Wing Road, 36 m., d. l. residue.
61	Ill.	23016		Bureau Junction to Peoria.	Chicago, Rock Island and Pacific.	47.16	1,150	22	20 by 9.6, f. f., a. l.
62	Mo.	28007		Moberly, Ottumwa.	Saint Louis, Kansas City and Northern.	130.81	1,127	17½	25.5½ by 7.7½, f. f., a. l.
63	Iowa	27017		Wilton Junction, Leavenworth.	Chicago, Rock Island and Pacific.	322.90	1,101	24	17.4 by 9.6 (average), f. f., a. l. to Egerton Junc., 301.40 m.; no r. a. residue.
64	Ill.	23018		Bloomington, East Saint Louis.	Chicago and Alton.	180.80	1,093	26	r. p. o., 25.7 by 8.10, f. f. c., a. l. to Road House, 110 m.; r. a. apt., 19.6 by 9.2 f. f., a. l.
65	Mich.	24017	24017	Detroit, Howard City.	Detroit, Lansing and Northern.	160.73	1,051	21	12 by 9.3, 13 by 9.3, f. f., a. l.
66	Wis.	25016	25016	Hilbert, Menosha.	Wisconsin Central.	16.16	1,044	26	7.7 by 6.10, f. f., a. l.
67	Wis.	25003	25003	Milwaukee, Berlin.	Chicago, Milwaukee and Saint Paul.	97.54	783	22	18.9 by 9.2, f. f., d. l. to Ripon, 81.89 m., a. l. residue.
68	Ill.	23005		Sterling, East Saint Louis.	Chicago, Burlington and Quincy (late Saint Louis, Rock Island and Chicago).	301.12	1,013	20	11.8 by 9.3, 12 by 7.3, f. f., a. l.
69	Mo.	28003		Saint Louis, Vinita.	Saint Louis and San Francisco.	364.25	1,483	20	21.11 by 7.3, f. f., a. l.
70	Ill.	23027		State Line, Warsaw.	Toledo, Peoria, and Warsaw.	230.21	973	24	18.8 by 8.4 (average), f. f., a. l.
71	Wis.	25024	25024	Racine, Rock Island.	Western Union.	196.40	963	18½	16.3 by 9.3, f. f., a. l.
72	Minn.	26003	26003	Saint Paul, Sauk Rapids.	Saint Paul, Minneapolis and Manitoba (late Saint Paul and Pacific).	76.3	1,446	18	18 by 8.7, f. f., a. l.
73	Mich.	24004	24004	White Pigeon, Grand Rapids.	Lake Shore and Michigan Southern.	95.67	933	24	16 by 9, f. f., a. l.
74	Ill.	23028		Terre Haute, East Saint Louis.	Indianapolis and Saint Louis.	189.99	932	27	r. p. o., 40 by 8.10, f. f. c., a. l.
75	Minn.	26005	26025	Saint Paul, Saint James.	Saint Paul and Sioux City.	122.53	1,365	22	22.6 by 9.4, f. f., a. l.
76	Minn.	26002	26006	Saint Paul, Breckenridge.	Saint Paul, Minneapolis and Manitoba (late Saint Paul and Pacific).	217.66	1,321	18	17.9 by 8.5, f. f., a. l.
77	Pa.	8003		Philadelphia, Westchester.	Westchester and Philadelphia.	26.35	760	18	8 by 5, 7 by 7, f. f., a. l.
78	Ill.	23041		Quincy, Hannibal.	Chicago, Burlington and Quincy.	19.69	857	20	11.3 by 7.4, f. f., a. l.
79	Iowa.	27010		Ottumwa, Mason City.	Central, of Iowa.	172.66	854	20	22 by 9.6, f. f., a. l.
80	Iowa.	27001		Burlington, Albert Lea.	Burlington, Cedar Rapids and Northern.	253.47	837	21	20 by 9.4, f. f., a. l.
81	Mo.	28020		Pierce City, Oswego.	Missouri and Western.	73.76	826	20	11.3 by 6.10 (average), f. f., a. l.
82	Mich.	24018	24018	Fort Wayne, Walton.	Grand Rapids and Indiana.	362.03	966	19	13.5 by 6.10 (average), f. f., d. l. bet Grand Rapids and Cadillac, 98 m., a. l. residue.
83	Ohio.	21004		Hudson, Columbus.	Cleveland, Mount Vernon and Delaware.	.....	809	28	15 by 7, f. f., a. l.
84	Mich.	24021	24021	New Buffalo, Pentwater.	Chicago and West Michigan.	170.20	774	17	12.2 by 8.5 (average), f. f., a. l.

States and Territories in which the contract-term expired June 30, 1879, &c.—Continued.

Trips per week	Pay per mile for r. p. o. cars.	Pay per mile for transportation.	Former pay per mile per annum.	Amount of annual pay.	Former amount of annual pay.	Date of readjustment or adjustment.	Remarks.	Order.
15. 37*	Dolls.	Dolls. 92 08	Dolls. 81 00	Dolls. 4,723 36	Dolls. 4,283 73	July 1, 1878	Combined returns August, 1878, and April, 1877; .26 m., at \$52.08.	60
12	91 40	85 50	4,314 06	4,018 50	July 1, 1879	.16 m. increase	61
7	90 68	68 40	11,855 31	8,955 40	July 1, 1879	.19 m. decrease	62
12. 3*	89 78	72 67½	28,989 96	23,457 31	July 1, 1879	.13 m. increase	63
14. 32*	15 62	88 92	113 16½	17,794 93	19,361 79	July 1, 1879	69.40 m. formerly, at \$96.61½; 70.80 m., at \$85.92.	64
8. 3*	87 21	78 00	14,016 39	12,844 26	July 1, 1879	3.95 m. decrease	65
12	87 21	51 30	1,409 31	820 80	July 1, 1879	Branch; main route, \$90.18 (50); .16 m. increase.	66
22	86 10	68 40	8,241 08	6,484 23	July 1, 1879	15.65 m., at \$76.10; 2.74 m. increase.	67
10. 9*	85 50	59 85	25,745 76	17,437 90	July 1, 1879	9.76 m. increase	68
8. 4*	84 82	78 06	30,895 68	28,200 81	July 1, 1879	37 m. formerly, at \$66.46.31.	69
16. 4*	83 79	70 00	19,289 29	16,612 50	July 1, 1879	Formerly \$600 for ferrriage; main route; branch, \$42.75 (250); 1.46 m. increase.	70
13	83 79	68 40	16,456 35	13,954 96	July 1, 1879	Main route; branch, \$42.75 (174).	71
12	83 45	49 93½	8,967 23	8,809 81	July 1, 1879	.....	72
13	82 08	76 95	7,852 59	7,361 81	July 1, 1879	.....	73
13*	25 00	82 08	178 00	20,344 12	33,642 00	July 1, 1879	.99 m. increase	74
12	80 72	72 50½	9,890 62	8,891 89	July 1, 1879	.11 m. decrease	75
10*	79 35	38 30½	17,271 32	8,311 58	July 1, 1879	.67 m. increase	76
24	79 20	67 54½	2,086 92	1,779 81	Nov. 24, 1877	In September, 1878. Rate reduced 5 per cent. from July 1, 1878.	77
18	78 66	106 87½	1,548 81	2,673 37	July 1, 1879	Main route; branch, \$50.45 (172); .29 m. increase.	78
12	78 66	56 43	13,581 48	9,569 40	July 1, 1879	Main route; branch, \$42.75 (297). Title reported, "Central Iowa Railway."	79
12	77 81	72 67½	19,722 50	18,535 16	July 1, 1879	33.93 m., from January 10, 1878.	80
7	77 81	65 83½	5,739 26	5,254 83	July 1, 1879	Main route; branch, \$42.75 (207). Title reported, "St. Louis and San Francisco."	81
14. 2*	77 08	53 35½	18,543 87	13,900 86	July 1, 1879	164.03 m., at \$67.03; 1.48 m. increase.	82
12	76 95	72 67½	11,225 46	10,601 83	Oct. 1, 1878	In October, 1878.....	83
12. 6*	75 24	82 00	12,805 84	13,985 92	July 1, 1879	Main route; branch, \$65.40 (104); .26 m. decrease.	84

F.—Table showing the readjustment of the rates of pay per mile on railroad routes in

Order.	State.	Number of route.	New number of route.	Terminal.	Corporate title of company carrying the mail.	Length of route.	Average weight of mails whole distance per day.	Miles per hour.	Size, &c., of mail-car or apartment.
						Miles.	Lbs.		Feet and inches.
85	Ohio	21051	21051	Columbus, Portsmouth.	Scioto Valley	102.10	764	25	9.4 by 8.8, f. f., a. l.
86	Ill.	23042	23042	Chicago, Danville.	Chicago and Eastern Illinois.	129	748	21½	16.9½ by 8.9 (average), f. f., a. l.
87	Ohio	21051	21051	Columbus, Portsmouth.	Scioto Valley	102.10	743	23	9.11 by 8.8½ (average), f. f., a. l.
88	Ill.	23008	23008	Rushville, Yates City.	Chicago, Burlington and Quincy.	63.92	488	20	13.5½ by 8.8, f. f., d. l. to Lewiston, 30.31 m.; a. l. residue.
89	Mo.	28018	28018	Keokuk, Clarksville.	Saint Louis, Keokuk and Northwestern.	96.20	703	20	19 by 8.6, f. f., a. l.
90	Wis.	25014	25030	Elroy, Saint Paul.	Chicago, Saint Paul and Minneapolis.	198.4	1,131	20	24 by 9, f. f., a. l.
91	Minn.	26018	26026	Saint James, Sioux City.	Sioux City and Saint Paul.	148.41	1,107	22	22.6 by 9.4, f. f., a. l.
92	Cal.	48028	48028	San Francisco, Tracy Junction.	Central Pacific.	71.73	688	16	10 by 8.9, f. f., a. l.
93	Iowa	27025	27025	Calmar, Pattersonville.	Chicago, Milwaukee and Saint Paul.	224.46	679	18	19.6 by 9.2, f. f., a. l.
94	Iowa	27012	27012	Clinton, La Crescent.	Chicago, Clinton, Dubuque and Minnesota.	181.24	666	16	18.4 by 8.16, f. f., a. l.
95	Mich.	24002	24002	Monroe, Adrian.	Lake Shore and Michigan Southern.	84.82	649	24	13 by 9, f. f., a. l.
96	N. Y.	6072	6072	Lyons, Sayre.	Geneva, Ithaca and Sayre.	92.62	649	24	12 by 7, f. f., a. l.
97	Pa.	8027	8027	Lancaster, Middletown.	Pennsylvania.	81.5	547	19	10.11 by 8.7, f. f., a. l.
98	Col.	38004	38008	Denver, Cheyenne.	Colorado Central.	135.62	638	25	16 by 8, f. f., a. l.
99	Iowa	27011	27011	Burlington, Keokuk.	Chicago, Burlington and Quincy.	43.66	626	22	19.6 by 8.9, f. f., a. l.
100	Iowa	27019	27019	Keokuk, Des Moines.	Keokuk and Des Moines.	162.88	626	21	14 by 9 (av.), f. f., a. l.
101	Texas	31005	31005	Bremond, Waco.	Houston and Texas Central.	44.09	632	20	14 by 7.3, f. f., a. l.
102	Minn.	26006	26021	White Bear Lake, Albert Lea.	Minneapolis and Saint Louis.	123.54	619	23	22.1 by 9.4, f. f., a. l. between Minneapolis and Albert Lea, 108 m.
103	Col.	38007	38007	Denver, Cheyenne.	Denver Pacific Railway and Telegraph Co.	106	612	23	12 by 7, f. f., a. l.
104	Mich.	24021	24021	Holland, Grand Rapids.	Chicago and West Michigan.	25.9	604	19	12.11 by 9.3 (av.), f. f., a. l.
105	S. C.	14003	14003	Kingsville, Augusta.	South Carolina.	118	583	24	16.6 by 8.4, f. f., a. l.
106	Minn.	26020	26005	Brokenridge, Saint Vincent.	Saint Paul, Minneapolis and Manitoba (late Saint Paul and Pacific).	202.91	873	15½	No apt., no r. a. l.
107	Wis.	25018	25018	Milwaukee, Two Rivers.	Milwaukee, Lake Shore and Western.	85	578	17	11 by 7.11, f. f., a. l.
108	S. C.	14003	14003	Kingsville, Columbia.	South Carolina.	25.7	577	24	16.6 by 8.4, f. f., a. l.
109	Ill.	23040	23040	Peoria, Rock Island.	Rock Island and Peoria.	91.68	571	24	11.9 by 8.9½, f. f., a. l.
110	Ill.	23037	23037	Vincennes, Cairo.	Cairo and Vincennes.	158	570	28	11.9 by 8.9, f. f., a. l.
111	Mo.	28028	28028	Saint Joseph, Hopkins.	Kansas City, Saint Joseph and Council Bluffs.	61.5	556	22½	13.4 by 7.5, f. f., a. l.
112	Mich.	24003	24003	Adrian, Jackson.	Lake Shore and Michigan Southern.	47.24	555	23	12 by 8.4, f. f., a. l.
113	Iowa	27022	27022	Waterloo, Mona.	Illinois Central.	79.70	548	15	16.6 by 8.16 (av.), f. f., a. l.
114	Iowa	27005	27005	Red Oak, Eastport.	Chicago, Burlington and Quincy.	50	548	22	13.6 by 8.4, f. f., a. l.
115	Ill.	23012	23012	Streator, Aurora.	Chicago, Burlington and Quincy.	61.84	548	24	23.5 by 8.16, f. f., a. l.

States and Territories in which the contract-term expired June 30, 1879, &c.—Continued.

Tripa per week.	Pay per mile for r. p. o. cars.	Pay per mile for transportation.	Former pay per mile per annum.	Amount of annual pay.	Former amount of annual pay.	Date of readjustment or adjustment.	Remarks.	Order.
	Dolls.	Dolls.	Dolls.	Dolls.	Dolls.			
12. 53*	75 24	47 02½	7, 682 00	2, 434 01	Nov. 12, 1878	50.34 m., from January 21, 1878, at \$79.20. In November, 1878.		85
12	74 30	64 12½	9, 506 81	8, 224 08	July 1, 1879	Main route; branch, \$42.75 (305); .75 m. decrease.		86
12. 4*	74 30	75 24	7, 506 21	7, 682 00	July 1, 1879	In July, 1879.		87
10. 7*	73 27	48 73½	4, 347 31	3, 106 85	July 1, 1879	33.61 m., at \$63.37. Main route; branch, \$48.94 (179). 17 m. increase.		88
12	72 68	75 00	6, 901 81	6, 909 19	July 1, 1879	26.08 m. formerly, at \$64.12½; 9.40 m. from February 1, 1877, at \$76.50.		89
12. 49*	72 51	60 19½	14, 885 98	12, 061 57	July 1, 1879	Branch of this route, Stillwater to Stillwater Junction, has been made a Minnesota route; .60 m. decrease.		90
6	71 82	54 72	10, 660 96	6, 721 25	July 1, 1879	25.61 m., extension to Sioux City, from July 1, 1879.		91
7	71 82				Sept. 8, 1878	New. In February, 1879.		92
6	70 97	38 98½	12, 940 65	10, 759 95	July 1, 1879	98.30 m. from January 1, 1879; 1.64 m. decrease; 210.66 m., at \$56.78.		93
8. 9*	70 97	68 00	12, 862 60	12, 224 36	July 1, 1879	1.47 m. increase.		94
12	70 11	68 40	2, 441 23	2, 409 73	July 1, 1879	.41 m. decrease.		95
12. 02*	70 11	59 85	6, 493 58	4, 640 00	Jan. 20, 1879	37 m. formerly, at \$60.70½; 15.62 m. extension from January 20, 1879. In May, 1879.		96
10. 12*	69 30	62 10	2, 182 95	1, 966 15	Jan. 1, 1878	60 days in March and April, 1878. Rate reduced 5 per cent. from July 1, 1878.		97
7	69 26	60 71	9, 398 04	8, 238 49	July 22, 1878	Main route; branches \$—, \$—.		98
12	69 26	66 09	8, 025 98	2, 851 00	July 1, 1879	.94 m. increase.		99
12	69 26	76 00	11, 281 06	12 378 56	July 1, 1879	.07 m. increase.		100
6	69 25	70 11	8, 053 23		Dec. 1, 1878	Combined weighings for April and December, 1878.		101
8. 65*	68 40	60 25	8, 450 12	7, 752 73	July 1, 1879	Formerly 41 m. at \$50; .19 m. increase.		102
7	68 40	137 70	7, 250 40	14, 596 20	July 1, 1878	In July, 1878. Formerly part of Kansas route \$3001.		103
6	68 40	68 00	1, 771 56	1, 812 20	July 1, 1879	Branch; main route \$75.24 (84). .75 m. decrease.		104
12. 62*	67 55	59 85	7, 970 90	7, 062 30	July 1, 1879	Main route; branches \$101.48, \$66.69, \$42.75 (47, 108, 289). In April, 1879.		105
6	66 96				Dec. 1, 1877	New. Main route; branch, \$34.20 (315). From July 1, 1878; rate reduced 5 per cent.; .66 m. increase.		106
12	66 69	75 00	5, 668 65	6, 375 00	July 1, 1879	Main route; branch, \$53.87 (158).		107
12	66 69	59 85	1, 713 98	1, 538 14	July 1, 1879	Branch; main route, \$67.55 (105). In April, 1879.		108
12	66 69	53 86½	6, 114 13	4, 955 53	July 1, 1879	.32 m. decrease.		109
6	66 69	64 12½	10, 537 02	10, 131 75	July 1, 1879			110
13	65 84	59 85	4, 049 16	3, 680 78	July 1, 1879			111
11. 5*	65 84	55 57½	3, 110 28	2, 625 92	July 1, 1879	.01 m. decrease.		112
12	65 84	73 00	5, 247 44	5, 840 00	July 1, 1879	.30 m. decrease.		113
6	65 84	46 56½	3, 292 00	2, 325 60	July 1, 1879	Branch; main route, \$164.16; wt. \$40, r. p. o. (21).		114
12	65 84	51 30	4, 071 54	3, 118 52	July 1, 1879	Main route; branch, \$42.75 (304). 1.05 m. increase.		115

F.—Table showing the readjustment of the rates of pay per mile on railroad routes in

Order.	State.	Number of route.	Termini.	Corporate title of company carrying the mail.	Length of route.	Average weight of mails whole distance per day.	Miles per hour.	Size, &c., of mail-car or apartment.
		New number of route.			Miles.	Lbs.		Feet and inches.
116	Minn.	26012	26812 Austin, Mason City	Chicago, Milwaukee and Saint Paul.	41.47	542	214	12.2 by 9.5, f. f., a. l.
117	N. Y.	5074	Ithaca, De Ruyter	Utica, Ithaca and Elmira.	43	551	21	11.8 by 6.5, f. f., a. l.
118	Mo.	28032	Atchison, Edgerton Junction.	Chicago, Rock Island and Pacific.	30	379	18	16 by 9.6, f. f., a. l.
119	Iowa	27007	Creston, Hopkins	Burlington and Missouri River.	44.40	537	23	15.3 by 7.4, f. f., a. l.
120	Mich.	24009	24009 Jackson, Gaylord	Michigan Central.	234.94	624	19	11.7 by 8.10 (av.), f. f., a. l.
121	N. Y.	5061	Brockton, Corry	Buffalo, Chautauque Lake and Pittsburgh.	44.8	524	27	10 by 6, f. f., a. l.
122	N. Y.	0080	Canastota, De Ruyter.	Cazenovia, Canastota and De Ruyter.	29.60	523	21	11.8 by 6.5, f. f., a. l.
123	N. Y.	6036	De Kalb Junction, Norwood.	Rome, Watertown and Ogdensburg.	25	520	25	No apt.; no r. a.
124	Cal.	46029	Miles, San José	Central Pacific.	18.07	367	20	In b. c.; no r. a.
125	Wis.	25011	25011 Kenosha, Rockford	Chicago and Northwestern.	72.50	432	17	12.6 by 7.2, f. f., a. l.
126	W. Va.	12005	Stenbenville, Wheeling.	Pittsburgh, Cincinnati and Saint Louis.	26.13	437	20	In b. c.
127	Iowa	27015	Des Moines, Indianola.	Chicago, Rock Island and Pacific.	22.07	489	19	9 by 7, f. f., a. l.
128	Mich.	24022	24039 Port Huron, Flint	Northwestern Grand Trunk (date Chicago and Lake Huron).	66.15	402	23	13 by 7 (av.), f. f., a. l.
129	Iowa	27031	Des Moines, Fort Dodge.	Des Moines and Fort Dodge.	87.00	450	18	16.6 by 8.3, f. f., a. l.
130	Mo.	28015	Reokuk, Centreville	Missouri, Iowa and Nebraska.	91.42	452	20	18.3 by 7, f. f., a. l.
131	Ill.	23029	Urbana, Havana	Indianapolis, Bloomington and Western.	103.14	445	23	9.9 by 7.2, f. f., a. l.
132	Mich.	24025	24008 Jackson, Niles	Michigan Central.	103.08	442	224	10.8 by 8.0, 10.10 by 7, f. f., a. l.
133	Ill.	23038	Peoria, Jacksonville	Peoria, Pekin and Jacksonville.	84.24	437	20	13 by 7.8, f. f., a. l.
134	Mo.	28012	Saint Joseph, Lexington.	Saint Louis, Kansas City and Northern.	76.86	433	18	25.5 by 7.7, f. f., a. l.
135	N. Y.	6102	Rochester, Sala manca.	Rochester and State Line.	108.92	380	23	14.2 by 7.2, f. f., a. l.
136	Iowa	27030	Des Moines, Callamun.	Des Moines and Minnesota.	57.92	380	15	11 by 5.2, f. f.; no r. a.
137	Pa.	8104	South West Junction, Oliphant Furnace	Pennsylvania.	41.9	421	21	10 by 8.3, f. f., a. l.
138	Mich.	24020	24038 Lansing, Ft. Wayne Junction.	Chicago and Lake Huron.	167.75	421	20	13.6 by 6.6, f. f., a. l.
139	Iowa	27030	Des Moines, Callamun.	Des Moines and Minneapolis.	57.92	419	15	10.4 by 6.2, f. f., a. l.
140	Ill.	23024	Peoria, Decatur	Pekin, Lincoln and Decatur.	80.02	417	25	10 by 7.6, f. f., a. l.
141	Mich.	24036	24025 Flint, Lansing	Chicago and Northeastern.	50.18	406	25	13.6 by 6.5, f. f., a. l.
142	N. H.	1002	Concord, Portsmouth.	Concord.	59.16	402	25	13.6 by 6.7, f. f., a. l.
143	Iowa	27003	Cedar Rapids, Holland.	Burlington, Cedar Rapids and Northern.	50.45	392	12	10.2 by 9.3, f. f., a. l.
144	Iowa	27015	Somerseset Junction, Winterset.	Chicago, Rock Island and Pacific.	27.04	383	19	9 by 7, f. f., a. l.
145	Mo.	28019	Quincy, Novinger	Quincy, Missouri and Pacific.	79.28	381	20	11.2 by 7.2, f. f., a. l.
146	Wis.	25026	25020 Warren, Mineral Point.	Mineral Point.	33.49	380	15	No apt.; no r. a.
147	Iowa	27029	California Junction, Fremont.	Sioux City and Pacific.	32.23	379	15	13.5 by 9, f. f., a. l.
148	Ill.	23033	Beardstown, Shawneetown.	Ohio and Mississippi.	229.70	377	19	13.7 by 8.1 (av.), f. f., a. l.

States and Territories in which the contract-term expired June 30, 1879, &c.—Continued.

Trips per week.	Pay per mile for r. p. & cars.	Pay per mile for transportation.	Former pay per mile per annum.	Amount of annual pay.	Former amount of annual pay.	Date of readjustment or adjustment.	Remarks.	Order.
12	Dolls.	Dolls.	Dolls.	Dolls.	Dolls.			
7.39*	65 84	50 00	2,730 38	2,060 00	July 1, 1879	.09 m. increase		116
7	65 83	53 01	2,830 60	1,210 23	Jan. 14, 1879	20 m. extension from January 14, 1879. In May, 1879.		117
9*	65 00				Jan. 1, 1876	New. Rates reduced 10 and 5 per cent. from July 1, 1876, and July 1, 1878, respectively.		118
37.21*	64 98	55 57	2,885 11	2,407 53	July 1, 1870			119
12	64 98	60 00	15,266 40	12,834 40	July 1, 1879	1.42 m. increase		120
7.5*	64 98				Aug. 22, 1878	New. In July, 1879		121
12	64 98	42 75	1,923 40	641 25	Feb. 10, 1879	14.6 m. extension from February 10, 1879. In May, 1879.		122
12	64 00	52 20	1,624 50	1,305 00	Mar. 1, 1879	Branch; main route, \$142 (37). In March, 1879.		123
12	63 00				July 1, 1874	New. Rate reduced 10 and 5 per cent. from July 1, 1876, and July 1, 1878, respectively. In April, 1878.		124
7.8*	62 42	75 00	4,525 45	5,520 00	July 1, 1879	1.10 m. decrease		125
12	62 10				Feb. 25, 1878	New. Rate reduced 5 per cent. from July 1, 1878. In November, 1878.		126
14.3*	61 56	47 02	1,358 02	1,006 33	July 1, 1879	Main route; branch, \$55.58 (144). .67 m. increase.		127
9.00*	60 71	42 75	4,015 06	2,846 72	July 1, 1879	.44 m. decrease		128
7.8*	60 71	45 31	5,336 40	4,034 84	July 1, 1879	1.14 m. decrease		129
6	60 71	50 00	5,550 10	4,633 01	July 1, 1879	5.79 m. from January 1, 1879.		130
6	59 85	42 75	6,172 92	4,300 42	July 1, 1879	Main route; branch, \$42.75 (208). .44 m. increase.		131
6.1*	59 85	52 00	6,220 21	5,437 64	July 1, 1879	.04 m. decrease		132
12	59 00	51 30	4,970 16	4,316 38	July 1, 1879	.10 m. increase		133
14	59 00	43 00	4,534 74	3,346 68	July 1, 1879	.11 m. increase		134
12	58 50				Sept. 1, 1877	New. 54.04 m. from August 1, 1878. In April, 1879.		135
13.5*	58 50				Mar. 1, 1878	Pay on 29.8 m. extension to Callahan. 37.12 m. under contract at \$50 per m. In November, 1878.		136
6	58 14	40 50	2,436 06	2,117 15	Mar. 1, 1879	4.6 m. from April 10, 1878, at \$61.20. In February, 1879.		137
6	58 14	42 75	9,752 98	7,105 05	July 1, 1879	1.55 m. increase		138
13.5*	58 14	50 00	3,567 46	3,011 96	July 1, 1879	20.80 m. formerly, at \$50.37		139
9	58 14	45 00	4,852 36	3,752 79	July 1, 1879	11.56 m. extension to Peoria, from March 1, 1879, at \$58.14.		140
6	57 29	42 75	2,874 81	2,145 19	July 1, 1879			141
12	56 43	58 50	3,298 39	3,460 86	July 1, 1879	Combined returns, August, 1878, and April, 1877.		142
6	56 43	42 75	2,846 89	2,508 04	July 1, 1879	25.68 m. from September 1, 1877.		143
12	55 58	42 75	1,502 88	1,154 67	July 1, 1879	Branch; main route, \$61.56 (127). .06 m. decrease.		144
12	55 58	58 00	4,406 38	4,578 88	July 1, 1879	8 m. from February 1, 1879.		145
12	55 58	42 75	1,861 37	1,410 75	July 1, 1879	.40 m. increase		146
6	54 72	42 75	1,763 62	1,377 83	July 1, 1879	Branch; main route, \$111.15 (45).		147
8.46*	54 72	59 85	12,569 18	13,747 54	July 1, 1879			148

F.—Table showing the readjustment of the rates of pay per mile on railroad routes in

Order	State.	Number of route.	New number of route.	Termini.	Corporate title of company carrying the mail.	Length of route.	Average weight of mails whole distance per day.	Miles per hour.	Size, &c., of mail-car or apartment.
						Miles.	Lbs.		Feet and inches.
149	Cal	46022		Woodland, Willow	Northern Railway	65.19	370	16	10 by 9, f. f., a. l.
150	Iowa	27020		Farley, Cedar Rapids.	Dubuque and South-western.	57.98	370	19	11 by 7.4, f. f., a. l.
151	Ill	23053		East Saint Louis, Cairo.	Cairo and Saint Louis.	154.80	370	18½	9.10 by 6.6 (av.), f. f., a. l.
152	Minn	26016 26023		La Crosse, Jackson	Southern Minnesota.	217.56	578	18	21.3 by 9.3, f. f., a. l.
153	Mich	24033 24016		Ionia, Blanchard.	Detroit, Lansing and Northern.	41.94	366	16	10.4 by 6.8, f. f., a. l.
154	Wis	25006 25006		Horicon, Portage	Chicago, Milwaukee and Saint Paul.	45.64	364	21	20 by 7.6, f. f., a. l.
155	Nebr	34010		Fremont, Wisner	Sioux City and Pacific.	51.47	363	15	13.5 by 9, f. f., a. l.
156	Mich	24036 24036		Grosse Ile, Fayette	Chicago and Canada Southern.	70.3	358	15	16 by 9, f. f., a. l.
157	Mich	24008 24029		Jackson, Ft. Wayne	Fort Wayne, Jackson, and Saginaw.	97.24	357	19	10.6 by 7.6, f. f., a. l.
158	Wis	25018 25018		Manitowoc, Clintonville.	Milwaukee, Lake Shore and Western.	80.09	356	17	11 by 7.11, f. f., a. l. to New London, 62.4 miles.
159	Ala	17015		Chattanooga, Meridian.	Alabama and Chattanooga.	295	556	30	11.10 by 7.2, f. f., a. l.
160	Iowa	27005		Pacific Junction, East Plattsmouth.	Chicago, Burlington and Quincy.	5.06	547	14	No apt.; no r. a.
161	Mich	24038 24019		Walton, Petoskey	Grand Rapids and Indiana.	71.81	546	19	13 by 7, f. f., a. l.
162	Iowa	27026		Conover, Decorah	Chicago, Milwaukee and Saint Paul.	9.50	343	13	In b. c.; no r. a.
163	Wis	25023 25023		Madison, Portage	Chicago, Milwaukee and Saint Paul (operating Chicago and Superior).	40.73	340	21	13.7 by 7.5, f. f., a. l.
164	Wis	25022 25031		Tomah, Wausau	Wisconsin Valley.	91.61	338	18	10.11 by 8.10, f. f., a. l.
165	Mo	28017		Sedalia, Lexington.	Missouri Pacific (lessees Lexington and Saint Louis).	56.25	337	18	10.6 by 7, f. f., a. l.
166	Iowa	27028		Savannah, Marion	Chicago, Milwaukee and Saint Paul.	89.08	333	22	10.2 by 7.1 (av.), f. f., a. l.
167	Mich	24041 24040		Marquette, L'Anse	Marquette, Houghton and Ontonagon.	63.48	526	20	12 by 7.2, f. f., a. l.
168	Ill	23048		Terre Haute, Peoria	Illinois Midland.	177.91	331	20	11.9 by 9, f. f., a. l.
169	Ill	23026		Ambia, Bloomington.	La Fayette, Bloomington and Mississippi.	81.08	326	25½	14 by 7.6, f. f., a. l.
170	Mo	28013		Brunswick, Pattonsburgh.	Brunswick, Chillicothe, Saint Louis, Council Bluffs and Omaha (Hatch & Van Ever, lessees).	80.05	321	15	8.8 by 7, fixtures a. l.
171	Ill	23051		Joliet, Peoria	Chicago, Pekin and Southwestern.	126.02	290	31	9.43 by 7.3, f. f., a. l.
172	Ill	23041		Fall Creek, Louisville.	Chicago, Burlington and Quincy.	31.92	316	15	11.3 by 7.4, f. f., a. l.
173	Minn	26019 26026		Worthington, Sioux Falls.	Worthington and Sioux Falls.	63.07	309	16	11.11 by 9.3, f. f., a. l.
174	Wis	25024 25024		Elkhorn, Eagle	Western Union	17.94	34	14	In b. c.; no r. a.
175	Mo	28009		Centralia, Columbia	Saint Louis, Kansas City and Northern.	22.14	305	18	25.51 by 7.7, f. f., a. l.
176	Wis	25027 25015		Stevens Point, Portage.	Wisconsin Central.	73.30	301	18½	7.7 by 6.10, f. f., a. l.
177	N. H.	1007		Wing Road, Fabyan House.	Boston, Concord and Montreal.	13.50	299	15	13.6 by 6.7, 9.11 by 6.9, f. f., a. l.
178	Ill	23047		Chester, Tamaroa	Wabash, Chester and Western.	41.75	295	14	9.10 by 7.4, f. f., a. l.

States and Territories in which the contract-term expired June 30, 1879, &c—Continued.

Trips per week.	Pay per mile for r. p. o. cars.	Pay per mile for transportation.	Former pay per mile per annum.	Amount of annual pay.	Former amount of annual pay.	Date of readjustment or adjustment.	Remarks.	Order.
	Dolls.	Dolls.	Dolls.	Dolls.	Dolls.			
6		54 72	46 17	3,567 19	1,833 87	Nov. 1, 1878	Pay formerly on 39.72 miles. In February, 1879.	149
6		54 72	52 00	3,172 66	2,879 24	July 1, 1879	2.61 m. increase	150
6		54 72	47 88	8,470 65	7,110 18	July 1, 1879	6.30 m. increase	151
6		53 36	46 51	11,609 00	10,430 81	July 1, 1879	20.62 m. from August 1, 1878, 26.25 m. from January 1, 1879. .20 m. increase.	152
9.05*		53 87	50 00	2,259 30	2,171 05	July 1, 1879	16.81 m. at \$53.87 from January 1, 1879. .18 m. decrease.	153
6		53 87	50 00	2,458 62	2,362 50	July 1, 1879	.39 m. increase	154
6		53 87				July 1, 1879	New. In March, 1879.	155
2.6*		53 87	50 00	3,787 06	3,515 00	July 1, 1879		156
9.09*		53 87	58 14	5,238 31	5,629 11	July 1, 1879	.42 m. increase	157
7.2*		53 87	45 00	4,314 44	3,833 82	July 1, 1879	Branch; main route, \$66.69 (107). 21.06 m. formerly, at \$51.30. 13.94 m. formerly, at \$53.87. .59 m. increase.	158
7		52 67	34 20	15,860 31	10,298 47	July 1, 1879	24.5 m. formerly, at \$42.75. 24.5 m. at \$65.84. In July, 1879.	159
12		52 67	34 20	266 51	136 80	July 1, 1879	Branch; main route, \$164.16 wt., \$40, r. p. o. (21). 1.06 m. increase.	160
6		52 67	38 98	3,782 23	2,801 67	July 1, 1879	.05 m. decrease	161
12		52 16	55 00	495 52	522 50	July 1, 1879		162
6		52 16	42 75	2,124 47	1,688 62	July 1, 1879	1.23 m. increase	163
6		52 16	42 75	4,778 37	3,849 21	July 1, 1879	1.57 m. increase	164
6		52 16	42 75	2,934 00	2,404 69	July 1, 1879		165
6		52 16	50 00	4,646 41	4,512 50	July 1, 1879	1.17 m. decrease	166
7.3*		51 99	45 82	3,800 32	2,908 24	July 1, 1879	Main route; branch, \$34.20. .02 m. increase.	167
6		51 30	50 00	9,126 78	8,996 50	July 1, 1879	2.02 m. decrease	168
6		51 30	42 75	4,159 40	3,468 73	July 1, 1879	.06 m. decrease	169
8.84*		51 30	48 73	4,106 56	3,901 24	July 1, 1879		170
6		51 30				July 21, 1876	New	171
6		50 45	72 67	1,610 36	2,242 02	July 1, 1879	Branch; main route, \$78.66 (78); 1.07 m. increase.	172
6		50 45	47 02	3,181 89	2,964 61	July 1, 1879	.02 m. increase	173
6		50 00				July 1, 1875	New; from July 1, 1876, rate reduced 10 per cent.; and from July 1, 1878, reduced 5 per cent.; branch; main route, \$83.79 (71); .16 m. decrease.	174
14		49 59	42 75	1,097 92	940 50	July 1, 1879	.14 m. increase	175
6		49 59	46 17	3,634 94	3,381 02	July 1, 1879	.07 m. increase	176
12		49 59	50 00	669 48	607 50	July 1, 1878	Combined returns, Aug., 1878, and April, 1877.	177
6		48 74	50 44	2,034 89	2,118 69	July 1, 1879	.25 m. decrease	178

F.—Table showing the readjustment of the rates of pay per mile on railroad routes in

Order.	State.	Number of route.	New number of route.	Termini	Corporate title of company carrying the mail.	Length of route.	Average weight of mail whole distance per day.	Miles per hour.	Size, &c., of mail-car or apartment.
						Miles.	Lbs.		Feet and inches.
470 Ill.		23008		Elmwood, Buda.	Chicago, Burlington and Quincy.	47.80	294	28	12.6 by 6.7, f.f., a.l.
180 Iowa.		27008		Burlington, La. Clide.	Burlington and South-western.	182.37	323	19	14 by 9, f.f., a.l.
181 Wis.		25017	25017	Menasha, Ashland.	Wisconsin Central.	250.42	321	25	7.7 by 6.10, f.f., a.l. to Phillips, 172.43 m.; no r. a.; res. 78 m.
182 Ill.		23011		Burlington, Quincy.	Chicago, Burlington and Quincy.	73.65	284	19	10.6 by 8.10, f.f., a.l.
183 N. C.		13010		Raleigh, Hamlet.	Raleigh and Augusta Air Line.	101.28	292	15	12 by 9, f.f., a.l.
184 Mich.		24028	24005	Jonesville, Lansing.	Lake Shore and Michigan Southern.	60.86	281	14	17.8 by 9.4, f.f., a.l.
185 Wjs.		25008	25008	Oshkosh, Ripon.	Chicago, Milwaukee and Saint Paul.	20.95	277	14	12 by 7.2, f.f., a.l.
186 Wis.		25004	25004	Milton Junction, Moaroe.	Chicago, Milwaukee and Saint Paul.	42.62	275	21	12.4 by 7.8, f.f., a.l.
187 Wis.		25013	25027	Green Bay, Winona.	Green Bay and Minnesota.	214.81	271	24	12 by 5.6, f.f., a.l.
188 Mich.		24030	24030	East Saginaw, Saint Louis.	Saginaw Valley and Saint Louis.	35.22	270	18	8 by 5.9, f.f., a.l.
189 Ill.		23055		Decatur, Bruin's Junction.	Indianapolis, Decatur and Springfield.	101.97	263	21	16.8 by 7.3, f.f., a.l.
190 Mo.		28024		Holden, Paola.	Missouri, Kansas and Texas.	55	265	12	13.9 by 7.4, f.f., a.l.
191 Mo.		26008		Tipton, Booneville.	Missouri Pacific.	25.78	264	18	No r. a.
192 Wis.		25019	25019	Sheboygan, Princeton.	Sheboygan and Fond du Lac.	78.79	264	16	10 by 7.3, f.f., a.l.
193 Mich.		24034	24034	Walton, Traverse City.	Traverse City (late Continental Improvement Company.)	26.26	260	19	No apt.; no r. a.
194 Minn.		26019		Worthington, Sioux Falls.	Worthington and Sioux Falls.	63.05	266	18	12 by 8.8, f.f., a.l.
195 Ill.		23043		Streator, Altamont.	Chicago and Paducah.	156.81	259	19	11 by 7, f.f., a.l.
196 Mich.		24024	24024	Ypsilanti, Bankers.	Detroit, Hillsdale and Southeastern.	65.5	259	15	8.9 by 7, f.f., a.l.
197 Mo.		28021		Mexico, Cedar City.	Chicago and Alton.	50.62	258	12	17.5 by 9, f.f., a.l.
198 Ill.		23052		Cortland Station, Sycamore.	Sycamore and Cortland.	5.26	256	20	In b. c.; no r. a.
199 Ill.		23050		Vincennes, Danville.	Paris and Danville.	114.91	255	20	10 by 6, f.f., a.l.
200 Col.		38003		Forks Creek, Central City.	Colorado Central.	12.07	251	12	In b. c.
201 Iowa.		27016		Washington, Knoxville.	Chicago, Rock Island and Pacific.	78.83	250	25	10 by 9, f.f., a.l.
202 Wis.		25026	25026	Eau Claire, Chippewa Falls.	Chippewa Falls and Western.	11.67	240	20	In b. c.; no r. a.
203 Iowa.		27002		Cedar Rapids, Postville.	Burlington, Cedar Rapids and Northern.	90.80	238	16	10.4 by 7.2, f.f., a.l.
204 Minn.		26010	26010	Hastings, Montevideo.	Chicago, Milwaukee and Saint Paul.	157.28	306	12	12.6 by 9.2, f.f., a.l.
205 Tex.		31015		Henderson, Overton.	Henderson and Overton.	15.53	199	10	14 by 9; no r. a.
206 Pa.		8114		Washington, Wayneborough.	Washington & Wayneborough.	28.72	198	10	9 by 6.7, f.f.; no r. a.
207 Mo.		28020		Oronogo, Joplin.	Missouri and Western.	9.33	168	20	In b. c.; no r. a.
208 Pa.		8117		Newtown Junction, Newtown.	Philadelphia, Newtown and New York.	27.10	162	25	In b. c.; no r. a.
209 Ill.		23060		Parkersburgh, Mattoon.	Grayville and Mattoon.	60.66	156	18	10 by 7, f.f., a.l.

States and Territories in which the contract term expired June 30, 1879, &c.—Continued.

Trips per week.	Pay per mile for r. p. n. cars.	Pay per mile for transportation.	Former pay per mile per annum.	Amount of annual pay.	Former amount of annual pay.	Date of readjust- ment or adjust- ment.	Remarks.	Order.
	Dolls.	Dolls.	Dolls.	Dolls.	Dolls.			
7.7*	48 74	55 57½	2,329 77	2,800 87	July 1, 1879	Branch; main route, \$73.27; 179		
6	48 74	44 46	8,888 71	8,159 29	July 1, 1879	1.15 m. decrease	180	
6 to Phillips residue.	48 74	46 17	11,065 11	11,589 59	July 1, 1879	78 m. at \$34.12; .60 m. increase	181	
6	48 74	53 01	3,589 70	3,808 77	July 1, 1879	1.80 m. increase	182	
6	48 73½	42 75	4,935 88	2,492 84	May 15, 1879	42.5 m. from December 1, 1877, at \$51.30; rate reduced 5 per cent. from July 1, 1878; in May 1, 1879.	183	
8.3*	47 88	49 59	2,913 97	3,018 54	July 1, 1879	.01 m. decrease	184	
12	47 88	50 00	1,003 08	1,050 00	July 1, 1879	.05 m. decrease	185	
8.3*	47 88	58 00	2,046 04	2,482 46	July 1, 1879	.18 m. decrease	186	
6	47 03	52 00	10,102 51	11,253 32	July 1, 1879	1.60 m. decrease	187	
12	47 03	42 75	1,656 86	1,506 08	July 1, 1879		188	
6	47 03	42 75	4,795 64	4,359 21	July 1, 1879		189	
6	47 03	50 00	2,586 65	2,780 06	July 1, 1879		190	
6	47 03	43 60½	1,211 02	1,090 13	July 1, 1879		191	
12	47 03	50 00	3,765 46	4,012 50	July 1, 1879	Formerly \$60 m. m.; .26 m. decrease.	192	
6	47 03	42 75	1,235 00	1,122 62	July 1, 1879		193	
6	47 02	34 20	2,964 61	1,145 70	Aug. 1, 1878	29.55 m., extension from August 1, 1878. In December, 1878.	194	
6	46 17	50 00	7,239 91	7,840 00	July 1, 1879	.01 m. increase	195	
6	46 17	50 00	8,024 13	8,377 00	July 1, 1879	.04 m. decrease	196	
6	46 17	42 75	2,337 12	2,164 01	July 1, 1879		197	
15*	46 17	54 00	242 86	4 20	July 1, 1879	\$150 formerly for m. m.; .26 m. increase.	198	
6	46 17	44 46	5,305 39	5,076 69	July 1, 1879	.72 m. increase	199	
7	46 17	45 32	557 27	858 02	July 1, 1878	Pay formerly only on 7.9 m. branch; main route not weighed. In April, 1879.	200	
7.5*	46 17	42 75	3,639 58	3,473 79	July 1, 1879	25.23 m. from March 15, 1877; .41 m. decrease.	201	
15	45 32	42 75	528 88	498 89	July 1, 1879		202	
9	45 32	43 60½	4,522 93	4,351 78	July 1, 1879		203	
6	45 15	27 36	7,101 19	5,761 14	July 1, 1879	82.46 m. at \$45.15; from January 1, 1879.	204	
7	45 00				Apr. 15, 1878	New. Rate reduced 5 per cent. from July 1, 1878. In January, 1879.	205	
12	45 00				Jan. 10, 1878	New. In October, 1878. Rate reduced 5 per cent. from July 1, 1878.	206	
7	45 00				Feb. 1, 1878	Branch; main route, \$77.81 (81). New. Rate reduced 5 per cent. from July 1, 1878.	207	
12	45 00				May 1, 1878	New. Rate reduced 5 per cent. from July 1, 1878. In December, 1878.	208	
6	45 00				Feb. 1, 1878	New. From July 1, 1878, this rate reduced 5 per cent. under act of June 17, 1878.	209	

F.—Table showing the readjustment of the rates of pay per mile on railroad routes in

Order.	State.	Number of route.	New number of route.	Termini.	Corporate title of company carrying the mail.	Length of route.	Average weight of mails whole distance per day.	Miles per hour.	Size, &c., of mail car or apartment.
						Miles.	Lbs.		Feet and inches.
210	Pa.		8109	Abington, Broadysville.	Northeast Pennsylvania.	11.30	129	23	In b.c.; no r.a.
211	Pa.		8116	Honesdale, Carbon-dale.	Delaware and Hudson Canal.	17.30	138	15	In b.c.; no r.a.
212	Ohio		21058	Jackson, Springfield	Springfield, Jackson and Pomeroy.	108.92	115	19	16 by 8, f.f., a.l.
213	R. I.		4008	Riverpoint, Hope	Pawtuxet Valley.	3.10	109	12	No apt.; no r.a.
214	Mo.		28036	Springfield, Grove.	Ash Springfield, Western & Missouri.	20.08	97	13	12 by 8, f.f., no r.a.
215	Conn.		5020	Turnersville, Chester.	Col. Boston and New York Air Line.	4.19	95	14	No r.a.
216	Pa.		8112	Foxburg, Turkey City.	Foxburg, Saint Petersburg and Clarion.	8.60	89	15	In b.c.; no r.a.
217	Miss.		18010	Natchez, Red Lick.	Natchez, Jackson and Columbus.	34.32	80	13	10 by 7.6, f.f., a.l.
218	Ohio		21059	Cincinnati, Hamilton, and Dayton Junction, Mount Health.	G. H. Barrows (lessee of College Hill Railroad).	7.08	76	13	No apt.; no r.a.
219	Iowa		27089	Turkey River, Wadena.	Chicago, Clinton, Dubuque and Minnesota.	44.05	75	10	7.7 by 7.1, f.f., a.l.
220	Cal.		46025	West Oakland, Berkeley.	Central Pacific (West Berkeley Branch).	5.9	71	11	In b.c.; no r.a.
221	Pa.		8115	Pittsburgh, Findleyville.	Pittsburgh Southern.	19.26	63	15	In b.c.; no r.a.
222	N. J.		7042	Delaware Station, Blairstown.	Blairstown.	11.30	62	13	In b.c.; no r.a.
223	Mass.		3072	Boston, Waltham.	Fitchburgh.	10.90	58	15	No apt.; no r.a.
224	Mo.		28016	Pleasant Hill, Desoto Junction.	Atchison, Topeka and Santa Fe.	46.80	52	10	11.6 by 9; no r.a.
225	Ind.		22037	Anderson, Noblesville.	Anderson, Lebanon and Saint Louis.	20.30	40	20	In b.c.; no r.a.
226	Pa.		8033	Junction, East Berlin.	Hanover Branch.	7.21	33	16	10 by 6, f.f., no r.a.
227	Mich.	24040	24041	Saint Louis, Elmore	John A. Elwell (lessee of Chicago, Saginaw and Canada).	23.39	232	17	12 by 8, f.f., a.l.
228	N. H.		1004	Hookset, Pittsfield.	Concord.	20.35	228	18	7 by 4.6, f.f., a.l.
229	Iowa		27027	Davenport, Fayette Paul.	Davenport and Saint Paul.	129.33	227	18	10.6 by 4.1, f.f., a.l.
230	Mo.		28025	Salisbury, Glasgow	Saint Louis, Kansas City and Northern.	15.99	226	15	23.51 by 7.7, r.a.
231	Minn.	28007	28007	Saint Paul, Duluth.	Saint Paul and Duluth.	155.73	374	16	22 by 8.4, f.f., a.l.
232	Minn.	28014	28014	Saint Peter, Gary.	Winona and Saint Peter.	150.63	379	15	15.3 by 7.6, f.f., a.l.
233	Ill.		23054	Chicago, Byron	Chicago and Pacific.	88.85	223	18	10.6 by 4.1, a.l.
234	Ill.		23049	Springfield, Havana	Springfield and Northwestern.	47.48	221	20	12.6 by 6.1, f.f., a.l.
235	Ill.		23013	Mendota, Clinton	Chicago, Burlington and Quincy.	65.59	221	12	8.7 by 4.9, f.f., a.l.

States and Territories in which the contract-term expired June 30, 1879, &c.—Continued.

Trips per week.	Pay per mile for r. p. o. cars.	Pay per mile for transportation.	Former pay per mile per annum.	Amount of annual pay.	Former amount of annual pay.	Date of readjustment or adjustment.	Remarks.	Order.
	Dolls.	Dolls.	Dolls.	Dolls.	Dolls.			
12		45 00				July 1, 1877	New. Rate reduced 5 per cent. from July 1, 1878. In February, 1879.	210
12		45 00				Apr. 1, 1878	New. Rate reduced 5 per cent. from July 1, 1878. In December, 1878.	211
6		45 00				Jan. 1, 1878	New. Rate reduced 5 per cent. from July 1, 1878. 83.19 m. from September 2, 1878. In June, 1879.	212
7.9*		45 00				Apr. 1, 1878	New. Rate reduced 5 per cent. from July 1, 1878. In February, 1879.	213
6		45 00				May 1, 1878	New. Rate reduced 5 per cent. from July 1, 1878.	214
7.5*		45 00				Nov. 1, 1877	New. Rate reduced 5 per cent. from July 1, 1878. In January, 1879.	215
18		45 00				Dec. 1, 1877	New. Rate reduced 5 per cent. from July 1, 1878. In January, 1879.	216
7		45 00				Sept. 1, 1877	8.32 m. from July 1, 1878. New. Rate reduced 5 per cent. from July 1, 1878. In July, 1878.	217
24		45 00				Jan. 1, 1878	New. Rate reduced 5 per cent. from July 1, 1878. In November, 1878.	218
6		45 00				Feb. 1, 1878	New. Rate reduced 5 per cent. from July 1, 1878. In May, 1878.	219
13		45 00				July 1, 1877	New. Rate reduced 5 per cent. from July 1, 1878. In April, 1878.	220
6		45 00				Feb. 1, 1878	6.71 m. from October 15, 1878. New. Rate reduced 5 per cent. from July 1, 1878. In February, 1879.	221
6		45 00				May 1, 1878	New. Rate reduced 5 per cent. from July 1, 1878. In February, 1879.	222
14.8*		45 00				May 1, 1878	New. Rate reduced 5 per cent. from July 1, 1878. In May, 1879.	223
6		45 00				Apr. 12, 1877	Service only to Stanley, 25.5 m. New. In October, 1878.	224
6		45 00				Mar. 1, 1878	New. In September, 1878. Rate reduced 5 per cent. from July 1, 1878.	225
6		45 00				Oct. 15, 1877	Branch; main route. New. In January, 1879.	226
9*		44 48	38 47½	1,039 91	919 79	July 1, 1879	3.32 m. at \$44.48, from November 1, 1878.	227
6		44 48	45 90	904 76	931 06	July 1, 1878	Combined returns of August, 1878, and April, 1877.	228
6		44 48	43 60½	5,750 01	5,639 44	July 1, 1879		229
13		44 48	42 75	710 91	669 47	July 1, 1879	38 m. increase.	230
6*		43 78	60 87½	6,817 85	9,480 21	July 1, 1879		231
12		43 77				July 1, 1878	Pay on extension. Marshall to Gary, 40.97 m.; \$46.80 on 30 m.; \$21.60 on 79.66 m. In October, 1878.	232
6		43 61	38 47½	3,874 74	3,495 84	July 1, 1879	2.01 m. decrease.	233
7.3*		43 61	45 00	2,070 00	2,169 00	July 1, 1879	.72 m. decrease.	234
8.2*		43 61	42 75	2,860 37	2,744 12	July 1, 1879	1.40 m. increase.	235

F.—Table showing the readjustment of the rates of pay per mile on railroad routes in

Order.	State.	Number of route.	New number of route.	Termini.	Corporate title of company carrying the mail.	Length of route.	Average weight of mail whole distance per day.	Miles per hour.	Size, &c., of mail-car or apartment.
						Miles.	Lbs.		Feet and inches.
236	N. H.	1010		Contoocook Village, Peterboro.	Concord and Claremont	32.76	206	19	7 by 6.1 f., a. l.
237	Wis.	25021	25021	Callamine, Platteville.	Mineral Point	18.97	197	15	No apt.; no r. a.
238	Mich.	24062	24022	Muskegon, Big Rapids.	Chicago and West Michigan.	55.5	196	18	10.3 by 6.10 f. f., a. l.
239	Ind.	22003		Lawrenceburgh Junction.	Indianapolis, Cincinnati and Lafayette.	2.86	196	20	In b. c.; no r. a.
240	W. T.	43003		Olympia, Tenino.	Thurston County Railroad Construction Company.	15.31	193	19	10 by 3.6; no r. a.
241	Ill.	23944		Mattoon, Hervey City.	Decatur, Mattoon and Southern.	31.37	190	12	12 by 7.4 f. f., a. l.
242	Ill.	22025		Maysville, Pittsfield.	Wabash	6	189	23	No apt.; no r. a.
243	Mich.	24026	24026	Grand Rapids, White Cloud.	Grand Rapids, Newagen and Lake Shore.	47.03	182	14	7 by 4 f. f., a. l.
244	Mich.	24037	24037	Saint Clair, Richmond.	Michigan, Midland and Canada.	16.76	186	16	No apt.; no r. a.
245	Ohio.	21000		Columbia, Amelia.	Cincinnati and Portsmouth.	20.4	168	12	10.5 by 5.2 f. f., a. l.
246	Iowa	27024		Clinton, Anamosa.	Iowa Midland	71.57	167	20	— by —, f. f., a. l.
247	Ill.	22004		Elgin, Geneva.	Chicago and Northwestern.	43.05	164	27	9.6 by 3.5 f. f., a. l.
248	N. J.	7043		Keyport, Freehold.	Freehold and New York	14.14	161	25	In b. c.; no r. a.
249	Wis.	25082	25032	Woodman, Lancaster.	Chicago and Tomah.	30.69	160	12	In b. c.; no r. a.
250	Ill.	23027		La Harpe, Burlington.	Toledo, Peoria and Warsaw.	20.47	152	20	In b. c.; no r. a.
251	Minn.	26008	26008	White Bear Lake, Stillwater.	Saint Paul and Du Luth.	13.20	147	16	In b. c.
252	Pa.	8122		Allegheny Bridge, Bradford.	Kendall and Eldred	21.94	146	15	In b. c.; no r. a.
253	Ill.	23045		Carbondale, Marion.	Carbondale and Shawneetown.	18.36	145	18	In b. c.; no r. a.
254	Mich.	24019	24007	Kalamazoo, South Haven.	Michigan Central	40.65	141	11	12.7 by 6.6 f. f., a. l.
255	Iowa	27023		Beulah, Elkader.	Iowa Eastern	19.49	140	12	No apt.; no r. a.
256	Pa.	8085		Pittsburgh, Castle Shannon.	Pittsburgh and Castle Shannon.	7	139	12	In b. c.; no r. a.
257	Iowa	27013		Stanwood, Tipton.	Chicago and Northwestern.	9.44	138	19	No apt.; no r. a.
258	Minn.	26022	26022	Wabasha, Zumbrota.	Minnesota Midland	59.09	138	15	9.11 by 6.1 f. f., no r. a.
259	Mich.	24044	24020	Toledo, Ann Arbor.	Toledo and Ann Arbor.	48.15	132	23	No apt.; no r. a.
260	Kans.	33024		Parsons, Weir.	Memphis, Kansas and Colorado.	31.12	129	12	10 by 6 f. f., a. l.
261	Iowa	27043		Hastings, Sidney.	Chicago, Burlington and Quincy.	23.81	126	12	No apt.; no r. a.
262	Ill.	23039		Carbondale, Grand Tower.	Grand Tower Mining, Manufacturing and Transportation Company.	25.32	121	14	In locked chest.
263	Minn.	25014	26027	Stillwater, Stillwater Junction.	Stillwater and Taylor Falls.	3.25	120		No apt. In charge of baggage-master.
264	La.	30009		Terre Bonne, Thibodaux.	Morgan's Louisiana and Texas.	5.75	119	17	In b. c.; no r. a.
265	Mich.	24043	24014	East Saginaw, Caro.	Detroit and Bay City	33.72	117	17	No apt.; no r. a.
266	N. Y.	6104		Sardinia Junction (n. o.), Springville.	Springville and Sardinia	11.59	114	12	In b. c.; no r. a.
267	Mo.	28029		Hannibal, Prairieville.	Saint Louis, Hannibal and Keokuk.	47.69	113	16	No apt.; no r. a.
268	Ill.	23029		White Heath, Decatur.	Indianapolis, Bloomington and Western.	33.15	112	15	No apt.; no r. a.
269	Me.	19		Mechanics Falls, Canton.	Rumford Falls and Bucksfield.	27.71	111	18	No apt.; no r. a.
270	Pa.	8119		Shenandoah, Mahanoy Plane.	Philadelphia and Reading.	7.02	111	14	No apt.
271	Minn.	26024	26018	Chatfield, Plainview	Winona and Saint Peter	28.47	110	13	No apt.

States and Territories in which the contract-term expired June 30, 1879, &c.—Continued.

Trips per week.	Pay per mile for r. p. & cars.	Pay per mile for transportation.	Former pay per mile per annum.	Amount of annual pay.	Former amount of annual pay.	Date of readjust- ment or adjust- ment.	Remarks.	Order.
8. 6*	Dolls.	Dolls.	Dolls.	Dolls.	Dolls.	Sept. 2, 1879	Extension 17.76 m., from Sep- tember 2, 1878. In May, 1879.	286
12	42 75	48 00	1,400 40	720 00	720 00	July 1, 1879	13 m. increase	287
6	42 75	45 00	2,372 00	2,448 00	2,448 00	July 1, 1879	1.16 m. decrease	288
76	42 75					July 1, 1879	Branch; main route, \$287.56 In December, 1878.	289
12	42 75					Aug. 20, 1878	New. In March, 1879.	240
6	42 75	50 00	1,341 00	1,032 50	1,032 50	July 1, 1879	1.06 m. decrease	241
18	42 75	40 00	260 00	200 00	200 00	July 1, 1879	Branch; main route, \$100.50 (48).	242
12	42 75	50 00	2,030 50	2,207 70	2,207 70	July 1, 1879	Formerly 18.76 m., at \$45	243
12	42 75	50 00	716 40	898 00	898 00	July 1, 1879		244
12	42 75					July 15, 1878	New. In March and April, 1879.	245
6	42 75	50 00	3,000 01	2,705 00	2,705 00	July 1, 1879	1.50 m. decrease	246
6	42 75	50 00	1,866 03	2,208 00	2,208 00	July 1, 1879	.35 m. decrease	247
12	42 75					Aug. 1, 1878	In February, 1879. New	248
6	42 75					Feb. 1, 1879	New. .22 m. decrease	249
12	42 75					Mar. 22, 1875	New. Branch; main route, \$63.79 (70), 1.32 m. increase.	250
12	42 75	50 00	544 30	600 00	600 00	July 1, 1879		251
6	42 75					Feb. 1, 1879	New. In May, 1879.	252
12	42 75	45 00	784 89	810 00	810 00	July 1, 1879	.36 m. increase	253
6	42 75	50 00	1,737 78	1,987 00	1,987 00	July 1, 1879	.91 m. increase	254
6	42 75	50 00	833 19	979 50	979 50	July 1, 1879	.10 m. decrease	255
6	42 75	34 20	200 25	230 40	230 40	Oct. 1, 1878	In September, 1878.	256
12	42 75	50 00	403 56	440 50	440 50	July 1, 1879	.08 m. increase	257
6	42 75					Sept. 16, 1878	New. .57 m. decrease	258
6	42 75					Jan. 1, 1879	.53 m. increase	259
6	42 75					Aug. 16, 1878	5.41 m., from October 1, 1878. In February, 1879.	260
12	42 75					Feb. 1, 1879	New. 2.74 m. increase	261
12	42 75	38 47½	1,082 48	901 87	901 87	July 1, 1879	.32 m. increase	262
15	42 75	25 65	138 93	83 36	83 36	July 1, 1879	Late part of Wisconsin route No. 23014.	263
7	42 75					Mar. 1, 1879	New. In May, 1879.	264
15. 6*	42 75					Oct. 1, 1878	20.55 m., from March 16, 1879. New.	265
12	42 75					Dec. 1, 1878	New. In May, 1879.	266
6	42 75	38 47½	2,038 74	1,897 28	1,897 28	July 1, 1879	14.00 m., at \$42.75, from Au- gust 1, 1878.	267
6	42 75	38 47½	1,417 16	1,244 00	1,244 00	July 1, 1879	Branch; main route, \$59.85 (131). .80 m. increase.	268
6	42 75					Aug. 16, 1878	New. In May, 1879.	269
12	42 75					Nov. 15, 1878	New. In December, 1878.	270
12	42 75					Jan. 1, 1879	12.40 m., from February 1, 1879. .21 m. increase.	271

F.—Table showing the readjustment of the rates of pay per mile on railroad routes in

Order.	State.	Number of route.	New number of route.	Terminal.	Corporate title of company carrying the mail.	Length of route.	Average weight of mails whole distance per day.	Miles per hour.	Size, &c., of mail-car or apartment.
						Miles.	Lbs.		Feet and inches.
272	Ga.	15926		Toccoa, Elberton.	Elberton Air Line.	51	108 15		3.11 by 3.5, f. f., a. l.
273	Iowa	27044		Atlantic, Audubon.	Chicago, Rock Island and Pacific.	26.01	108 15		No apt.; no r. a.
274	N. J.	7036		Summit, Bernardsville.	Passaic and Delaware.	14.78	107 20		In b. c.; no r. a.
275	Wis.	25007	25007	Nepesank, Winneconne.	Chicago, Milwaukee and Saint Paul.	14.29	105 14		In b. c.; no r. a.
276	N. Y.	6105		Plattsburgh, Danemora.	Plattsburgh and Danemora.	17.69	104 20		16.8 by 7.2, f. f.; no r. a.
277	Ill.	23062		Kankakee, Chatsworth.	Kankakee and Southwestern.	41.78	103 15		In b. c.; no r. a.
278	R. I.	4009		Wood River Junction, Hope Valley.	Wood River Branch.	5.87	100 12		No apt.; no r. a.
279	Ill.	23056		Geneva, Batavia.	Chicago and Northwestern.	3.66	98 18		In b. c.; no r. a.
280	Texas	31016		Corpus Christi, Collins.	Corpus Christi, San Diego and Rio Grande Narrow Gauge.	40	98 12		In b. c.; no r. a.
281	Iowa	27040		Adams, Waukon.	Waukon and Mississippi Railroad Guaranty Company.	22.92	96 11		No apt.; no r. a.
282	Iowa	27042		Chariton, Indianola.	Chicago, Burlington and Quincy.	34.67	95 16		No apt.; no r. a.
283	Ill.	23046		Jacksonville, Virden.	Jacksonville, Northwestern and Southwestern.	31.68	94 13		7 by 6.6, f. f., a. l.
284	Wis.	25005	25005	Watertown, Madison.	Chicago, Milwaukee and Saint Paul.	39.05	94 21		13.7 by 7.5, f. f., a. l.
285	Minn.	26017	26024	Mankato, Wells.	Central of Minnesota.	40.81	90 21		8.1 by 7.1, f. f., a. l.
286	Pa.	8121		Olean, Bradford.	Olean, Bradford and Warren.	22.63	90 15		In b. c.; no r. a.
287	Mich.	24042	24032	Powers, Quinnesec.	Chicago and Northeastern (operating Menominee).	25.09	86 13		No apt.; no r. a.
288	Iowa	27045		Avoca, Harlan.	Chicago, Rock Island and Pacific.	12.40	84 14		No apt.; no r. a.
289	S. C.	14003		Kingsville, Camden.	South Carolina.	39.25	83 13		In b. c.; no r. a.
290	La.	30004		Terre Bonne, Houma.	Morgan's Louisiana and Texas.	15.33	75 25		No r. a.
291	Ala.	17004		Wetumpka, Elmore.	South and North Alabama.	6.81	63 15		Mails in chest.
292	Mich.	24027	24012	Miles, South Bend.	Michigan Central.	12.25	59 16		In b. c.; no r. a.
293	Ill.	23006		Kansas, Westfield.	Danville, Olney & Ohio River.	8.28	58 13		No apt.; no r. a.
294	Iowa	27046		Adell, Waukeo.	Des Moines, Adell and Western.	7.50	58 14		No apt.; no r. a.
295	Iowa	27041		Creston, Fontanelle.	Chicago, Burlington and Quincy.	31.42	52 16		No apt.; no r. a.
296	Del.	9505		Wilmington, Pomeroy.	Delaware Western.	38.85	52 13		7.5 by 6.10, f. f., a. l.
297	Iowa	27010		Albia, Eddyville Junction.	Central of Iowa.	14.84	49 8		In b. c.; no r. a.
298	Cal.	46030		Monterey, Salinas.	Monterey and Salinas Valley.	21	49 15		In b. c.
299	Texas	31017		Denison, White-wright.	Missouri, Kansas and Texas.	21.23	45 12		In b. c.; no r. a.
300	Iowa	27036		Newton, Monroe.	Newton and Monroe.	17.50	43 15		In b. c.; no r. a.
301	Pa.	8118		Latrobe, Ligonier.	Ligonier Valley.	11.04	42 15		Mails in locked closet.
302	Pa.	8130		Salisbury Junction (n. o.), Elk Lick.	Salisbury.	7.43	40 20		In b. c.; no r. a.
303	Utah	41006		Sandy, Alta.	Wasatch and Jordan Valley.	16.78	38 8		No apt.; no r. a.
304	Ill.	23012		Aurora, Batavia.	Chicago, Burlington and Quincy.	10.15	37 13		In b. c.; no r. a.
305	Ill.	23042		Bismarck, Snoddy's Mills.	Chicago and Eastern Illinois.	24.35	35 12		In b. c.; no r. a.
306	Va.	11019		Sutherland, Milton.	Milton and Sutherland Narrow-Gauge.	7	31 8		In b. c.; no r. a.

States and Territories in which the contract-term expired June 30, 1879, &c.—Continued.

Trips per week.	Pay per mile for r. p. o. cars.	Pay per mile for transportation.		Former pay per mile per annum.	Amount of annual pay.	Former amount of annual pay.	Date of readjustment or adjustment.	Remarks.	Order.
		Dolls.	Dolls.						
6		42 75					Oct. 1, 1878	New. 26 m. from December 1, 1878. In May, 1879.	272
6		42 75					Feb. 17, 1879	New. .17 m. increase.	273
6		42 75					Mar. 1, 1879	New. In June, 1879.	274
6		42 75	45 00		610 89	731 25	July 1, 1879	1.96 m. decrease	275
12		42 75					Feb. 1, 1879	New. In May, 1879	276
5		42 75					Nov. 15, 1878	New	277
18		42 75					Aug. 16, 1878	New. In May, 1879	278
12		42 75	50 00		156 46	175 00	July 1, 1879	.16 m. increase	279
6		42 75					Sept. 1, 1878	New. In May, 1879	280
12		42 75	38 47½		979 83	884 15	July 1, 1879	.06 m. increase	281
9		42 75					Feb. 1, 1879	New. 19.58 m. from March 15, 1879. .58 m. increase.	282
6		42 75	38 47½		1,354 32	1,207 73	July 1, 1879	.29 m. increase	283
6		42 75	50 00		1,669 38	1,922 50	July 1, 1879	.60 m. increase	284
6		42 75	34 20		1,744 62	1,404 25	July 1, 1879	.25 m. decrease	285
6		42 75					Feb. 1, 1879	New. In May, 1879	286
6		42 75					Apr. 15, 1878	New. .41 m. increase	287
6		42 75					Feb. 17, 1879	New. 2.49 m. decrease	288
6		42 75	38 47½		1,677 93	1,510 14	July 1, 1879	Branch; main route \$67.55 (105). In April, 1879.	289
7		42 75	50 00		655 35	764 00	July 1, 1878	.05 m. increase. In Apr., 1878.	290
7		42 75					Nov. 15, 1878	New. Branch; main route \$84.13½. In March, 1879.	291
9		42 75	50 00		523 68	610 00	July 1, 1879	.05 m. increase	292
6		42 75					Apr. 15, 1879	New	293
12		42 75					Mar. 1, 1879	.16 m. increase	294
6		42 75					Feb. 1, 1879	New. 6.80 m. not yet fixed. .72 m. increase.	295
6		42 75	38 47½		1,660 83	751 41	Feb. 10, 1879	19.32 m. extension from Feb. 10, 1879. In May, 1879.	296
6		42 75					July 1, 1879	New. Branch; main route \$78.66 (79). Title reported, "Central Iowa Railway."	297
7		42 75					Mar. 12, 1879	New. Pay ordered at same rate from July 1 to September 30, 1878. In July, 1879.	298
6		42 75					Feb. 1, 1879	New. In May, 1879	299
6		42 75	38 47½		748 12	688 75	July 1, 1879	.40 m. decrease	300
6		42 75					Oct. 1, 1878	New. In November, 1878	301
12		42 75					Feb. 1, 1879	New. In May, 1879	302
6		42 75					July 1, 1878	New. In May, 1879	303
6		42 75	51 30		433 91	461 70	July 1, 1879	Branch; main route \$65.84 (115). 1.15 m. increase.	304
6		42 75	34 20		1,040 96	831 06	July 1, 1879	Branch; main route \$74.89 (86). .05 m. increase.	305
6		42 75					Nov. 16, 1878	New. \$300.75 per annum for m. m. In May, 1879.	306

F.—Table showing the readjustment of the rates of pay per mile on railroad routes in

Order.	State.	Number of route.	New number of route.	Termini.	Corporate title of company carrying the mail.	Length of route.	Average weight of mail whole distance per day.	Miles per hour.	Size, &c., of mail-car or apartment.
						<i>Miles.</i>	<i>Lbs.</i>		<i>Feet and inches.</i>
307	Texas.....	31018		Brownsville, Brazos Santiago.	Rio Grande	28.04	28	21	In pass. car.....
308	Iowa.....	27037		Judd, Lehigh	Crooked Creek Railway and Coal Company.	8.5	20	12	No apt.; no r. a.
309	Col	28000		Boulder, Marshall	Golden, Boulder and Caribou.	6.75	12	8	Cab of locomotive
310	Ky	20023		Mt. Sterling, Eothwell.	Mount Sterling Coal Railroad.	19.21	40	8	In pass. car
311	Mo	28035		New Madrid, Malden.	Little River Valley and Arkansas.	27.10	12	14	7 by 6.6; f. f.; no r. a.
312	Mo	28005		Palmyra, Hannibal	Hannibal and Saint Joseph.	15	311	....	In b. o.
313	N. C.	13013		Jamesville, Washington.	Jamesville and Washington.	22.51	25	20	In pass. car
314	Minn ..	26004	26004	East Saint Cloud, Alexandria.	Saint Paul, Minneapolis and Manitoba (late Saint Paul & Pacific).	66.5	214	18	11 by 8.4; f. f., a. l.
315	Minn ..	26020	26005	Crookston, Fisher's Landing.	Saint Paul, Minneapolis and Manitoba (late Saint Paul & Pacific).	12.10	20	15	In b. c.; no r. a.
316	Mo	28023		Cuba, Salem	Saint Louis, Salem and Little Rock.	40.98	191	10	10 by 6.6; f. f.; 14
317	S. C.	14013		Chester C. H., Cedar Shoals.	Cheraw and Chester Narrow-Gauge.	18.50	58	12	In locked box....
Excess of present over former amount of annual pay by readjustment.....									

States and Territories in which the contract-term expired June 30, 1879, &c.—Continued.

Trips per week.	Pay per mile for r. p. o. cars.	Pay per mile for transportation.	Former pay per mile per annum.	Amount of annual pay.	Former amount of annual pay.	Date of readjustment or adjustment.	Remarks.	Order.
	Dolls.	Dolls.	Dolls.	Dolls.	Dolls.			
7	42 75	42 75	38 47 1/2	363 37	327 03	Feb. 1, 1879	New. In May, 1879	307
6	42 75	42 75	38 47 1/2	363 37	327 03	July 1, 1879	.....	308
6	42 75	42 75	38 47 1/2	363 37	327 03	Feb. 1, 1879	New. In April, 1879	309
7	40 50	40 50	38 47 1/2	363 37	327 03	Mar. 1, 1879	New. Rate reduced 5 per ct. from July 1, 1878. In October, 1878. Intermediate office supplied three times per week.	310
6	40 50	40 50	38 47 1/2	363 37	327 03	Mar. 15, 1878	New. Rate reduced 5 per ct. from July 1, 1878.	311
7	40 38	40 38	34 20	605 40	513 00	July 1, 1879	Branch; main route \$143.04 Wt. 25 lb. R. p. o. for 171 m (27)	312
6	36 00	36 00	38 47 1/2	363 37	327 03	Feb. 1, 1878	New. Rate reduced 5 per ct. from July 1, 1878. In Dec., 1878.	313
6	34 89	34 89	39 50	2,424 85	2,468 78	July 1, 1879	33.5 m. at \$84.80 from Jan. 1, 1879.	314
6	34 20	34 20	38 47 1/2	363 37	327 03	Jan. 16, 1879	New. Branch; main route \$63.62 (166). .01 m. increase.	315
3	29 92	29 92	28 50	1,226 12	1,165 08	July 1, 1879	10 m. increase	316
3	29 92	29 92	28 50	1,226 12	1,165 08	Nov. 16, 1878	New. In February, 1879	317
				2,694,925 48	2,499,533 41			
				235,392 07				

THOS. J. BRADY,
Second Assistant Postmaster-General.

Index to Table E.

Title.	Order.	Number of route.	New number of route.	Title.	Order.	Number of route.	New number of route.
Alabama and Chattanooga	345	17015	.....	Chicago and Tomah	265	25032	.....
Anderson, Lebanon and Saint Louis	219	22037	.....	Chicago and West Michigan	61	24021	.....
Atchison, Topeka and Santa Fe	218	28016	.....	Do	87	24021	.....
Do	308	28016	.....	Do	197	24023	24022
Belleville and El Dorado	280	23061	.....	Chicago, Burlington and Quincy	105	23005	.....
Blairtown	216	7042	.....	Do	3	23007	.....
Boston and Maine	18	8011	.....	Do	172	23007	.....
Do	27	11	.....	Do	289	23007	.....
Boston and New York Air-Line	208	5020	.....	Do	120	23008	.....
Boston, Concord and Montreal	39	1005	.....	Do	175	23008	.....
Do	62	1008	.....	Do	38	23009	.....
Do	148	1007	.....	Do	28	23010	.....
Brunswick, Chillicothe, Saint Louis, Council Bluffs and Omaha. (See Hatch & Van Every.)			.....	Do	129	23011	.....
Buffalo, Chautauqua Lake and Pittsburgh	95	6061	.....	Do	135	23012	.....
Burlington and Missouri River. (See Chicago, Burlington and Quincy.)			.....	Do	137	23012	.....
Burlington and Missouri River	258	27006	.....	Do	249	23013	.....
Do	119	27007	.....	Do	264	23014	.....
Do	251	27009	.....	Do	75	23041	.....
Burlington and Northwestern	307	27035	.....	Do	47	23041	.....
Burlington and Southwestern	221	27008	.....	Do	20	27005	.....
Burlington, Cedar Rapids and Northern	73	27001	.....	Do	184	27005	.....
Do	225	27002	.....	Do	346	27005	.....
Do	232	27003	.....	Do	91	27011	.....
Do	267	27004	.....	Do	252	27023	.....
Burrows, G. H. (lessee College Hill Railroad)	212	21059	.....	Do	312	27041	.....
Cairo and Saint Louis	178	23053	.....	Do	300	27042	.....
Cairo and Vincennes	97	23037	.....	Do	279	27043	.....
Carbondale and Shawneetown	201	23045	.....	Chicago, Clinton, Dubuque and Minnesota	86	27012	.....
Cazenovia, Canastota and De Ruyter	227	6080	.....	Do	213	27039	.....
Central of Iowa	117	27010	.....	Do	302	27039	.....
Do	313	27010	.....	Chicago, Milwaukee and Saint Paul	9	23035	.....
Central of Minnesota	350	26017	26024	Do	40	25001	.....
Central Pacific	42	46003	.....	Do	7	25002	.....
Central Pacific (West Berkeley branch)	214	46025	.....	Do	83	25003	.....
Central Pacific	77	46028	.....	Do	116	25004	.....
Do	124	46029	46028	Do	106	25005	.....
Cheraw and Chester Narrow Gauge	354	14013	.....	Do	144	25006	.....
Chicago and Alton	19	23017	.....	Do	206	25007	.....
Do	45	23018	.....	Do	149	25008	.....
Do	270	23019	.....	Chicago, Milwaukee and Saint Paul (operating Chicago and Superior)	236	25023	.....
Do	320	23019	.....	Chicago, Milwaukee and Saint Paul	321	25031	25022
Do	245	28021	.....	Do	51	26009	.....
Do	41	28022	.....	Do	256	26010	.....
Chicago and Canada Southern	145	24036	.....	Do	139	26012	.....
Chicago and Eastern Illinois	96	23042	.....	Do	21	26013	.....
Do	351	23042	.....	Do	329	27025	.....
Chicago and Iowa	261	23057	.....	Do	121	27026	.....
Chicago and Lake Huron	230	24020	24038	Do	146	27028	.....
Chicago and Northeastern	231	24039	24025	Chicago, Rock Island and Pacific	4	23015	.....
Chicago and Northwestern	11	23001	.....	Do	50	23016	.....
Do	5	23003	.....	Do	16	27014	.....
Do	160	23004	.....	Do	180	27015	.....
Do	165	23056	.....	Do	233	27015	.....
Chicago and Northwestern (operating Menomonee Railroad)	303	24042	24032	Do	246	27016	.....
Chicago and Northwestern	12	25006	.....	Do	72	27017	.....
Do	36	25010	.....	Do	296	27044	.....
Do	70	25011	.....	Do	304	27045	.....
Do	85	25013	25012	Do	93	28032	.....
Do	298	25030	25013	Chicago, Saginaw and Canada. (See Elwell, John A.)			.....
Do	164	27013	.....	Chicago, Saint Paul and Minneapolis	102	25014	25030
Chicago and Pacific	332	23054	.....	Chicago, Pekin and Southwestern	174	23051	.....
Chicago and Paducah	152	23043	.....	Chippewa Falls and Western	247	25026	.....
Chicago and Superior. (See Chicago, Milwaukee and Saint Paul.)			.....	Cincinnati and Portsmouth	280	21080	.....
			.....	Cleveland, Mount Vernon and Delaware	74	21004	.....
			.....	Colorado Central	190	28003	.....
			.....	Do	101	28004	28003
			.....	Concord	13	1001	.....
			.....	Do	111	1002	.....

Index to Table E—Continued.

Title.	Order.	Number of route.	New number of route.	Title.	Order.	Number of route.	New number of route.
Concord	209	1003	.....	Houston and Texas Central ..	43	31003	.....
Do	188	1004	.....	Do	80	31004	.....
College Hill Railroad. (See G. H. Burrows.)				Do	78	31005	.....
Concord and Claremont ..	177	1010	.....	Illinois Central	14	23020	.....
Continental Improvement Co. (See Traverse City.)				Do	46	23021	.....
Corpus Christi, San Diego and Rio Grande Narrow Gauge ..	290	31016	.....	Do	255	23034	.....
Crooked Creek Railway and Coal Company	341	27037	.....	Do	58	27021	.....
Danville, Olney and Ohio River ..	309	23006	.....	Do	71	27022	.....
Davenport and Northwestern ..	278	27018	.....	Illinois Midland	147	23048	.....
Davenport and Saint Paul ..	226	27027	.....	Indianapolis, Bloomington and Western ..	229	23029	.....
Decatur, Mattoon and Southern Delaware and Hudson Canal Company ..	155	23044	.....	Do	335	23029	.....
Delaware Western	203	8116	.....	Indianapolis, Cincinnati and La Fayette ..	253	23063	.....
Denver Pacific Railway and Telegraph Company ..	339	9505	.....	Indianapolis, Delphi and Chicago ..	311	22038	.....
Des Moines and Minneapolis ..	32	38007	.....	Indianapolis, Decatur and Springfield ..	243	23055	.....
Des Moines and Minnesota ..	141	27030	.....	Indianapolis and Saint Louis ..	22	23028	.....
Des Moines and Fort Dodge ..	142	27030	.....	Iowa Eastern	103	27023	.....
Des Moines and Adell and Western ..	191	27031	.....	Iowa Midland	150	27024	.....
Detroit and Bay City	310	27046	.....	Jacksonville, Northwestern and Southeastern ..	337	23046	.....
Do	60	24013	.....	Jamesville and Washington ..	344	13013	.....
Detroit, Grand Haven and Milwaukee ..	283	24043	24014	Kansas Central	258	33013	.....
Detroit, Hillsdale and Southwestern ..	49	24006	24027	Kansas City, Burlington and Santa Fe ..	343	33015	33019
Detroit, Lansing and Lake Michigan ..	153	24024	.....	Kansas City, Lawrence and Southern ..	50	33006	33008
Detroit, Lansing and Northern ..	143	24033	24016	Kansas City, Saint Joseph and Council Bluffs ..	30	28006	.....
Dubuque and Southwestern ..	64	24017	.....	Do	109	28028	.....
Eastern	132	27020	.....	Kankakee and Southwestern ..	296	23063	.....
Do	6	3001	.....	Keokuk and Des Moines ..	66	27019	.....
East Line and Red River ..	250	31013	.....	Kendall and Eldred ..	274	8122	.....
Elberton Air Line	293	15026	.....	La Crosse, Trempealeau and Prescott ..	25	25012	25014
Elwell, John A. (lessee Chicago, Saginaw and Canada) ..	331	24040	24041	La Fayette, Bloomington and Mississippi ..	239	23026	.....
European and North American Fitchburg ..	28	12	.....	Lake Shore and Michigan Southern ..	84	24002	.....
Flint and Pere Marquette ..	217	3072	.....	Do	118	24003	.....
Do	103	24015	.....	Do	65	24004	.....
Fort Wayne, Jackson and Saginaw ..	327	24015	.....	Do	178	24028	24005
Foxburg, Saint Petersburg and Clarion ..	114	24008	24029	Leavenworth, Lawrence and Galveston. (See Kansas City, Lawrence and Southern.)			
Freehold and New York ..	210	8112	.....	Ligonier Valley ..	317	8118	.....
Galveston, Harrisburgh and San Antonio ..	263	7043	.....	Little River Valley and Arkansas ..	326	28035	.....
Geneva, Ithaca and Sayre ..	52	31002	.....	Manchester and Lawrence ..	33	3063	.....
Golden, Boulder and Caribou ..	106	6072	.....	Marquette, Houghton and Ontonagon ..	189	24041	24040
Grand Haven	324	24023	.....	Do	353	24041	24040
Grand Rapids and Indiana ..	271	24018	.....	Memphis, Kansas and Colorado, Menominee. (See Chicago and Northwestern.)	277	33024	.....
Do	330	24038	24019	Michigan Air-Line ..	250	24012	24033
Grand Rapids, Newago and Lake Shore ..	157	24026	.....	Michigan Central ..	180	24005	24006
Grand Tower Mining, Manufacturing and Transportation Company ..	104	24009	.....	Do	104	24009	.....
Grand Trunk of Canada ..	333	23039	.....	Do	57	24010	.....
Gravity. (See Delaware and Hudson Canal.)	48	24007	24028	Do	162	24019	24007
Grayville and Mattoon ..	131	24025	.....	Do	168	24027	24012
Green Bay and Minnesota ..	268	23060	.....	Do	158	24037	.....
Grinnell and Montezuma ..	133	25015	25027	Michigan, Midland and Canada ..			
Hanover Branch	273	27032	.....	Milton and Sutherland Narrow Gauge ..	322	11019	.....
Hannibal and Saint Joseph ..	220	8033	.....	Milwaukee, Lake Shore and Western ..	69	25018	.....
Do	24	28005	.....	Do	193	25018	.....
Do	10	28010	.....	Mineral Point	234	25020	.....
Hatch & Van Every (lessees Brunswick, Chillicothe, Saint Louis, Council Bluffs and Omaha) ..	176	23013	.....	Do	154	25021	.....
Havana, Rantoul and Eastern ..	291	23058	.....	Minneapolis and Saint Louis ..	80	28006	28021
Henderson and Overton ..	195	31015	.....	Minnesota Midland ..	275	28022	.....
				Missouri, Iowa and Nebraska ..	140	28015	.....
				Missouri Pacific ..	2	28001	.....
				Do	224	28008	.....

Index to Table E—Continued.

Title.	Order.	Number of route.	New number of route.	Title.	Order.	Number of route.	New number of route.
Missouri Pacific (lessee Lexington and Saint Louis)	238	28047		South Carolina	238	14008	
Missouri River, Fort Scott and Gulf	55	32005	32008	Southern Minnesota	153	26014	26028
Missouri, Kansas and Texas	23	28041		South and North Alabama	246	27004	
Do	29	28044		Spartanburgh and Asheville	281	14011	
Do	150	28024		Springfield and Northwestern	194	28049	
Do	315	31017		Springfield and Western Missouri	207	28036	
Missouri and Western	92	28020		Springfield, Jackson and Potosi	204	21058	
Do	196	28020		Springville and Sardina	284	6104	
Morgan's Louisiana and Texas	167	30004		Saint Louis, Alton and Terre Haute	44	28020	
Do	282	30009		Saint Louis, Kansas City and Northern	34	28004	
Monterey and Salinas Valley	314	40080		Do	61	28007	
Mount Sterling Coal Railroad	325	20023		Do	223	28012	
Natchez, Jackson and Columbus	211	18010		Do	240	28008	
Do	305	18019		Do	248	28025	
New Orleans, Saint Louis and Chicago	81	30001		Saint Louis, Hannibal and Keokuk	234	28023	
Newton and Monroe	340	27086		Saint Louis and San Francisco	63	28003	
Northeast Pennsylvania	202	6109		Saint Louis, Keokuk and Northwestern	68	28016	
Northern	185	40022		Saint Louis, Salem and Little Rock	355	28023	
Northwestern Grand Trunk (late Chicago and Lake Huron)	228	24022	24039	Saint Paul and Duluth	190	26007	
North Wisconsin	272	25028		Do	161	28002	
Ohio and Mississippi	15	28016		Saint Paul and Sioux City	76	28005	28025
Do	110	28033		Saint Paul, Minneapolis and Manitoba	342	28002	28006
Ocean, Bradford and Warren	301	6121		Do	170	28003	
Olympia and Tenino. (See Thurston County Railroad Construction Company.)				Do	328	28004	28015
Oregon and California	58	44001		Do	80	28020	28015
Paris and Danville	223	23050		Do	352	28020	28015
Pasadena and Delaware	294	7086		Saint Paul, Stillwater and Taylor Falls	357	25014	28027
Pawtuxet Valley	305	4006		Sycamore and Cortland	123	28063	
Pekin, Lincoln and Decatur	192	23024		Terre Haute and Indianapolis (Saint Louis, Vandalia and Terre Haute)	1	23061	
Peoria, Pekin and Jacksonville	136	28088		Thurston County Railroad Construction Company	254	43008	
Pennsylvania	98	6027		Toledo and Ann Arbor	276	24044	24029
Do	171	8104		Toledo, Canada Southern and Detroit	64	24035	
Philadelphia, Newtown and New York	199	8117		Toledo, Peoria and Warsaw	79	23027	
Philadelphia and Reading	286	8119		Do	246	23037	
Pine River Valley and Stevens Point	262	25039		Traverse City	244	24024	
Pittsburgh and Castle Shannon	349	8096		Tuckerton	290	7032	
Pittsburgh, Cincinnati and Saint Louis	99	12005		Utica, Ithaca and Elmira	128	0674	
Pittsburgh Southern	215	8115		Wabash	17	23028	
Plattsburgh and Dannemora	295	6105		Do	87	23025	
Quincy, Missouri and Pacific	115	28019		Do	158	28025	
Raleigh and Augusta Air Line	241	13016		Wabash, Chester and Western	128	23047	
Rio Grande	323	31018		Wasatch and Jordan Valley	319	41006	
Rochester and State Line	112	6102		Washington and Waynesborough	193	6114	
Rock Island and Mercer County	278	23050		Waukon and Mississippi Railroad Guarantee Company	336	27040	
Rock Island and Peoria	126	23040		West Chester and Philadelphia	86	8003	
Rome, Watertown and Ogdensburg	35	6086		Western	285	18011	
Do	130	6086		West End Barrow-Gauge	316	28051	
Rumford Falls and Buckfield	287	19		Western Union	82	25014	
Saginaw Valley and Saint Louis	242	24030		Do	189	25024	
Salisbury	318	8120		Winona and Saint Peter	163	26014	
Scioto Valley	67	21051		Do	299	26024	26015
Do	179	21051		Wisconsin Central	118	25014	
Sheboygan and Fond du Lac	151	25019		Do	194	25014	
Sioux City and Pacific	56	27029		Do	187	26017	
Do	235	27029		Do	186	25037	25015
Do	125	34010		Wisconsin Valley	227	25023	25031
Sioux City and Saint Paul	122	26018	26026	Wood River Branch	297	4080	
Sioux City and Pembina	287	27024		Worthington and Sioux Falls	181	26019	26020
South Carolina	94	14003		Do	849	26019	
Do	107	14003		Wyandotte, Kansas City and Northern	266	28033	
Do	108	14003					

Index to Table F.

Title.	Order.	Number of route.	New number of route.	Title.	Order.	Number of route.	New number of route.
Alabama and Chattahoochee	169	17015		Chicago, Milwaukee and Saint Paul	154	25006	25006
Anderson, Lebanon and Saint Louis	225	22037		Do	275	25007	25007
Atchison, Topeka and Santa Fe	224	28016		Do. (operating Chicago and Superior)	103	25022	25022
Bakertown	222	7042		Do	204	26010	26010
Boston, Concord and Montreal	177	1007		Do	114	26012	26012
Do	60	1008		Do	15	26013	26013
Do	34	1008		Do	63		27025
Boston and Maine	33	11		Do	162		27026
Do	20	3011		Do	116		27028
Boston and New York Air Line	215	5020		Chicago and Northwestern (operating Menominee)	141	24089	24025
Brunswick, Chillicothe, Saint Louis, Council Bluffs, and Omaha (Hatch & Van Ever, lessees)	170	28013		Do	287	24042	24032
Buffalo, Chautauque Lake and Pittsburgh	121	4041		Chicago and Northwestern	19		23001
Burlington, Cedar Rapids and Northern	60	27001		Do	11		23003
Do	203	27002		Do	9		23003
Do	148	27008		Do	247		23004
Burlington and Missouri River	119	27007		Do	279		23056
Burlington and Southwestern	180	27008		Do	31	25009	25009
Burrows, G. H. (lessee College Hill Railroad)	218	21050		Do	56	25010	25010
Cairo and Saint Louis	151	23053		Do	125	25011	25011
Cairo and Vincennes	110	23037		Do	39	25013	25012
Carbondale and Shawneetown	253	23045		Do	257		27013
Cassonville, Canastota and De Ruyter	122	6080		Chicago and Pacific	238		23054
Central of Iowa	297	27010		Chicago and Paducah	195		23043
Do	79	27010		Chicago, Pekin and Southwestern	171		23051
Central of Minnesota	235	26017	26024	Chicago, Rock Island and Pacific	7		23015
Central Pacific	40	46008		Do	61		23016
Do. (West Berkeley Branch)	220	46025		Do	12		27014
Do	92	46028		Do	144		27015
Do	124	46029		Do	127		27015
Cheraw and Chester	317	14013		Do	201		27016
Chicago and Alton	26	23017		Do	63		27017
Do	64	23018		Do	273		27044
Do	197	23021		Do	288		27045
Do	49	23022		Do	118		23032
Chicago, Burlington and Quincy	68	23005		Chicago, Saint Paul and Minneapolis	90	25014	25020
Do	2	23007		Chicago and Tomah	249	25032	25032
Do	3	23007		Chicago and West Michigan	84	24021	24021
Do	179	23008		Do	104	24021	24021
Do	86	23008		Do	238	24032	24022
Do	44	23008		Chippewa Falls and Western	202	25026	25026
Do	14	23010		Cincinnati and Portsmouth	245		21060
Do	162	23011		Cleveland, Mount Vernon and Delaware	83		21064
Do	304	23012		Concord	18		1601
Do	115	23012		Do	142		1002
Do	235	23013		Do	228		1004
Do	172	23041		Concord and Claremont	236		1010
Do	78	23041		Colorado Central	290		27016
Do	21	27005		Do	98	30004	30003
Do	160	27006		Corpus Christi, San Diego and Rio Grande Narrow-Gauge	280		31016
Do	114	27005		Crooked Creek Railway and Coal Company	368		27087
Do	90	27011		Danville, Olney and Ohio River	293		23086
Do	295	27041		Davenport and Saint Paul	229		27027
Do	282	27042		Decatur, Mattoon and Southern	241		23044
Do	261	27043		Delaware and Hudson Canal	211		8116
Chicago and Canada Southern	156	24036	24036	Delaware Western	296		9505
Chicago, Clinton, Dubuque and Minnesota	54	27012		Denver Pacific Railway and Telegraph Company	103		38007
Do	219	27039		Des Moines, Adell and Western	294		27046
Chicago and Eastern Illinois	86	23042		Des Moines and Fort Dodge	129		27031
Do	305	23042		Des Moines and Minnesota	136		27030
Chicago and Lake Huron	138	24020	24038	Des Moines and Minneapolis	139		27030
Chicago, Milwaukee and Saint Paul	4	23035		Detroit and Bay City	53	24013	24013
Do	85	25001	25001	Do	265	24043	24014
Do	10	25002	25002	Detroit, Grand Haven and Milwaukee	41	24006	24037
Do	67	25008	25008	Detroit, Hillsdale and South-eastern	196	24024	24024
Do	186	25004	25004				
Do	284	25005	25005				

Index to Table F—Continued.

Title.	Order.	Number of route.	New number of route.	Title.	Order.	Number of route.	New number of route.
Detroit, Lansing and Northern	153	24023	24016	Memphis, Kansas and Colorado	280	.....	33044
Do	85	24017	24017	Michigan Central	128	24005	24005
Dubuque and Southwestern	150	.....	27026	Do	254	24019	24007
Eastern	8	.....	3001	Do	182	24025	24006
Do	7	.....	15026	Do	120	24009	24009
Elberton Air-Line	272	.....	.....	Do	58	24010	24010
Elwell, John A. (lessee Chicago	227	24040	24041	Do	282	.....	24012
Saginaw and Canada)	23	.....	12	Michigan Midland and Canada	244	24037	24037
European and North American	23	.....	3072	Milton and Sutherland Narrow-	306	.....	11019
Fitchburgh	22	.....	.....	Gauge	146	25020	25020
Foxburgh, Saint Petersburg and	216	.....	8112	Mineral Point	237	25021	25021
and Clarion	248	.....	7043	Do	.....	.....	.....
Freehold and New York	157	24008	24029	Milwaukee, Lake Shore and	158	25018	25018
Fort Wayne, Jackson and Sag-	46	.....	31002	Western	107	25018	25018
inaw	96	.....	6072	Do	102	25006	25021
Galveston, Harrisburg and San	300	.....	38008	Minneapolis and Saint Louis	258	25023	25022
Antonio	82	24018	24018	Minnesota Midland	130	.....	25015
Geneva, Ithaca and Sayre	161	24038	24019	Missouri, Iowa and Nebraska	57	33005	33005
Golden, Boulder and Caribou	243	24026	24026	Missouri River, Fort Scott and	17	.....	25011
Grand Rapids and Indiana	262	.....	23039	Gulf	190	.....	25014
Do	38	24007	24028	Missouri, Kansas and Texas	299	.....	25017
Grand Rapids, Newago and	209	.....	23060	Do	5	.....	25001
Lake Shore	187	25015	25027	Missouri Pacific	191	.....	25008
Grand Tower Mining, Manu-	27	.....	28005	Do	.....	.....	.....
facturing, and Transporta-	312	.....	28010	Do (lessees Lexington	185	.....	25017
tion Company	24	.....	8033	and Saint Louis)	207	.....	25020
Grand Trunk of Canada	226	.....	31015	Missouri and Western	81	.....	25020
Grayville and Mattoon	205	.....	31003	Do	280	.....	25004
Green Bay and Minnesota	101	.....	31005	Morgan's, Louisiana and Texas	284	.....	25008
Hannibal and Saint Joseph	28	.....	23020	Do	296	.....	25008
Do	54	.....	23031	Monterey and Salinas Valley	310	.....	25023
Do	113	.....	27022	Mount Sterling Coal Railroad	.....	.....	.....
Illinois Central	168	.....	23048	Natchez, Jackson and Colum-	217	.....	18010
Do	268	.....	23029	bus	30	.....	33001
Do	151	.....	23029	New Orleans, Saint Louis and	300	.....	27038
Indianapolis, Cincinnati and	239	.....	22003	Chicago	210	.....	2100
La Fayette	180	.....	23055	Newton and Monroe	149	.....	46022
Indianapolis, Decatur and	74	.....	23028	Northeast Pennsylvania	.....	.....	.....
Springfield	255	.....	27023	Northern Railway	.....	.....	.....
Indianapolis and Saint Louis	240	.....	27024	Northwestern Grand Trunk	128	24022	24020
Iowa Eastern	283	.....	23046	(late Chicago and Lake Hu-	18	.....	22010
Iowa Midland	313	.....	13013	ron)	148	.....	23022
Jacksonville, Northwestern	277	.....	23062	Do	286	.....	8121
and Southeastern	25	.....	28006	Olean, Bradford and Warren	51	.....	44001
Jamestown and Washington	111	.....	28028	Oregon and California	199	.....	22050
Kankakee and Southwestern	252	.....	8123	Paris and Danville	274	.....	7038
Kansas City, Saint Joseph, and	100	.....	27019	Pasadena and Delaware	213	.....	4008
Council Bluffs	43	25012	25014	Pawtuxet Valley	140	.....	23024
Do	169	.....	23026	Pekin, Lincoln and Decatur	137	.....	8104
La Fayette, Bloomington and	95	24002	24002	Pennsylvania	97	.....	8027
Mississippi	112	24003	24003	Peoria, Pekin and Jacksonville	133	.....	23038
Lake Shore and Michigan	73	24004	24004	Philadelphia, Newtown and	208	.....	8117
Southern	184	.....	24005	New York	270	.....	8119
Do	55	33008	33006	Philadelphia and Reading	256	.....	805
Do	301	.....	8118	Pittsburgh and Castle Shannon	126	.....	15005
Ligonier Valley	311	.....	28035	Pittsburgh, Cincinnati and	221	.....	8115
Little River Valley and Ar-	33	.....	3003	Saint Louis	276	.....	221
kansas	107	24041	24040	Plattsburgh and Danemora	145	.....	25019
Manchester and Lawrence	.....	.....	.....	Quincy, Missouri and Pacific	183	.....	13010
Marquette, Houghton and On-	.....	.....	.....	Raleigh and Augusta Air-Line	307	.....	31014
tenagon	.....	.....	.....	Rio Grande	135	.....	6102
	.....	.....	.....	Rochester and State Line	109	.....	23040
	.....	.....	.....	Rock Island and Peoria	123	.....	6036
	.....	.....	.....	Rome, Watertown and Og-	37	.....	6038
	.....	.....	.....	densburgh	269	.....	19
	.....	.....	.....	Do	188	24030	24030
	.....	.....	.....	Rumford Falls and Buckfield	302	.....	8129
	.....	.....	.....	Saginaw Valley and Saint Louis	85	.....	21051
	.....	.....	.....	Salsbury	87	.....	21051
	.....	.....	.....	Scioto Valley	192	25019	25019
	.....	.....	.....	Do	.....	.....	.....
	.....	.....	.....	Sheboygan and Fond du Lac	.....	.....	.....

Index to Table F—Continued.

Title.	Order.	Number of route.	New number of route.	Title.	Order.	Number of route.	New number of route.
Sioux City and Pacific.....	45	.....	27029	Saint Paul, Minneapolis and Manitoba (late Saint Paul and Pacific).....	76	28002	28006
Do	147	.....	27029	Saint Louis and San Francisco.	89	.....	28003
Do	155	.....	34010	Sycamore and Cortland	198	.....	23052
Sioux City and Saint Paul	91	28018	28028	Terre Haute and Indianapolis	1	.....	23031
South Carolina	47	.....	14003	Thurston County Railroad	240	.....	43003
Do	108	.....	14003	Construction Company.....	259	24044	24020
Do	289	.....	14003	Toledo and Ann Arbor	16	24035	24035
Do	105	.....	14003	Toledo, Canada Southern and Detroit	70	.....	23027
South and North Alabama	291	.....	17004	Toledo, Peoria and Warsaw	259	.....	23027
Southern Minnesota	152	28016	28023	Do	193	24034	24034
Springfield and Northwest-ern	234	.....	23049	Traverse City (late Continental Improvement Company)	117	.....	6074
Springfield, Jackson and Pom-eroy	212	.....	21058	Utica, Ithaca and Elmira	22	.....	23023
Springfield, Western and Mis-souri	214	.....	28036	Wabash	242	.....	23025
Springville and Sardinia	266	.....	6104	Do	48	.....	23025
Stillwater and Taylor Falls	263	25014	26027	Do	178	.....	23047
Saint Paul and Duluth	231	28007	26007	Wabash, Chester and Western	206	.....	8114
Do	251	28008	26008	Washington and Waynesbo-rough	303	.....	41006
Saint Paul and Sioux City	75	28005	26025	Wasatch and Jordan Valley	281	.....	27040
Saint Louis, Alton and Terre Haute	42	.....	23030	Waukon and Mississippi Rail-road Guarantee Company	174	25024	25024
Saint Louis, Hannibal and Keokuk	267	.....	28029	Western Union	71	25024	25024
Saint Louis, Kansas and Northern	62	.....	28007	Do	77	.....	8003
Do	175	.....	28009	Westchester and Philadelphia	232	28014	28014
Do	134	.....	28012	Winona and Saint Peter	271	28024	28018
Do	230	.....	28025	Do	68	25016	25016
Saint Louis, Keokuk and Northwestern	89	.....	28018	Do	50	25016	25016
Saint Paul, Minneapolis and Manitoba (late Saint Paul and Pacific)	72	28003	28003	Do	181	25017	25017
Do	314	28004	28004	Do	176	25027	25015
Do	315	28020	28005	Wisconsin Central	164	25022	25031
Do	106	28020	28005	Wisconsin Valley	278	.....	4009
				Wood River Branch	194	.....	28019
				Worthington and Sioux Falls	173	28020	28019
				Do			

11 P M G

G.—Statement of the number, description, and prices of mail-bags, mail-catchers, and mail locks and keys purchased, and of the expense incurred on account thereof, during the fiscal year ended June 30, 1879, viz :

Number.	Description.	Size.	Prices.	Cost.	Aggregate cost.
2,000	Leather mail-pouches	2	\$5 70	\$11,400 00	
1,000	.....do.....	3	4 75	4,750 00	
2,000	.....do.....	4	3 80	7,600 00	
2,000	.....do.....	5	2 70	5,400 00	
7,000	Royalty on leather mail-pouches		10	700 00	
					\$29,850 0
237	Canvas through registered mail-pouches	1	6 12	1,450 44	
333	.....do.....	2	5 17½	1,723 27	
1,500	.....do.....	2	5 95	8,925 00	
190	.....do.....	3	3 95	750 50	
2,260	.....do.....				12,849 21
8,200	Canvas mail-catcher pouches		4 25		13,600 00
753	Leather horse mail-bags	1	6 60	4,969 80	
608	.....do.....	2	5 60	3,404 80	
200	.....do.....	3	5 10	1,020 00	
1,561	Royalty on 1,500 leather horse mail-bags		10	150 00	
					9,544 60
58,000	Jute canvas mail-sacks	1	78	45,240 00	
15,000	.....do.....	2	52	7,800 00	
9,000	.....do.....	3	15	1,350 00	
82,000	.....do.....				54,390 00
1,000	Cotton canvas mail-sacks (foreign mails)	1	1 32	1,320 00	
1,000	.....do.....	2	1 02	1,020 00	
6,000	.....do.....	3	21	1,260 00	
8,000	.....do.....				3,600 00
12,000	Mail-bag label-cases		12		1,440 00
635,950	Printed wooden tags		3 mills	1,907 85	
1,000	.....do.....		4½ mills	4 50	
5,000	Sheets mail-bag label-cards		10½	525 00	
2,000	Brass tags for through registered pouches		09	180 00	
	Royalty on cord clamps for mail-bags			262 00	
					2,879 35
	Repairs of mail-bags				37,612 16
300	Mail-catchers				4,500 00
	Total expense of mail-bags and mail-catchers				170,286 26
	MAIL LOCKS AND KEYS.				
10,000	Iron mail-locks		58	5,800 00	
6,000	Street letter-box locks repaired		50	3,000 00	
1,500	Through registered mail-locks		1 75	2,625 00	
150	Through registered mail-keys		30	45 00	
	Personal service of locksmith			130 00	
70	Through registered mail-key safety-chains		86½	60 55	
4,000	Mail-key safety-chains		28	1,120 00	
	Total expense of mail locks and keys				12,780 55

THOS. J. BRADY,
Second Assistant Postmaster-General.

H.—Statement of all contracts in operation during the year ended June 30, 1879, for mail-bags, mail-catchers, mail-bag labels, and label-cases.

Articles contracted for.	Names of contractors.	Residence.	Term of contract.		Prices.				
			From—	To—	Size No. 1.	Size No. 2.	Size No. 3.	Size No. 4.	Size No. 5.
Leather mail-pouches.....	John C. Feltman.....	Albany, N. Y.....	Nov. 25, 1875	July 1, 1879	\$6 50	\$5 70	\$4 75	\$3 80	\$2 70
Use of patent for pouches.....	John Boyle.....	New York, N. Y.....	July 1, 1875	July 1, 1879	10	10	10	10	10
Leather horse mail-bags.....	P. S. Thomson.....	Jersey City, N. J.....	July 1, 1875	July 1, 1879	6 60	5 60	5 10	5 10	5 10
Jute canvas mail-bags.....	John Boyle.....	New York, N. Y.....	July 1, 1875	July 1, 1879	78	52	15	15	15
Cotton canvas sacks.....	do.....	do.....	July 1, 1875	July 1, 1879	1 32	1 02	21	21	21
Mail-bag label-cases.....	Gaylord Manufacturing Company.....	Chicopee, Mass.....	July 1, 1875	July 1, 1879	12	12	12	12	12
Printed wooden tags.....	A. J. Cullers.....	Woodstock, Va.....	July 1, 1875	July 1, 1879	003	003	003	003	003
Mail-bag catchers.....	Younglove & Co.....	Cleveland, Ohio.....	June 1, 1878	June 1, 1879	15 00	15 00	15 00	15 00	15 00
Mail-bag catcher-sockets.....	do.....	do.....	.....	.....	70	40	40	40	40

No contracts in operation for mail locks and keys during year ended June 30, 1879.

THOS. J. BRADY,
Second Assistant Postmaster-General.

I.—Railway post-office lines in the United States June 30, 1879,

Terminal points.	Miles of route.	Miles of service.	Service each way.	\$1,400.	\$1,800.	\$1,150.	\$1,000.	\$800.	\$640.
Albany to Buffalo, N. Y.	298	2,284	Four daily	3	15	10	13	2	...
Atlanta to Augusta, Ga.	171	242	Daily	...	...	4	...	...	...
Baltimore, Md., to Williamsport, Pa.	181	362	do	3	1	3	...	...	...
Baltimore, Md., to Grafton, W. Va.	294	1,176	Twice daily	12	7	1	1	...	...
Bangor to Vanceborough, Me.	114	228	Daily	...	4	...	...	...	...
Bloomington, Ill., to Mexico, Mo.	200	400	do	4	...	...	...	...	...
Boston, Mass., to Portland, Me.	116	232	do	4	4	...	...	...	...
Boston, Mass., to Troy, N. Y.	192	768	Twice daily	10	8	2	1	...	...
Boston, Mass., to Saint Albans, Vt.	264	1,056	do	1	8	5	1	...	...
Boston, Mass., to Albany, N. Y.	202	808	do	1	11	7	1	3	...
Boston to Wellfleet, Mass.	106	424	do	...	5	1	...	...	...
Boston to Pittsburgh, Mass.	...	...	...	...	...	...	...	...	...
Boston, Mass., to Bangor, Me.	243	972	Twice daily	1	8	10	4	...	...
Bristol to Chattanooga, Tenn.	242	484	Daily	...	2	2	1	2	...
Buffalo, N. Y., to Toledo, Ohio.	295	1,770	Thrice daily	2	11	30	17	1	...
Cairo to Centralia, Ill.	112	224	Daily	3	1	1	...	...	...
Chattanooga, Tenn., to Atlanta, Ga.	140	280	do	2	3	7	...	...	...
Chicago, Ill., to Fort Howard, Wis.	242	484	do	...	4	5	...	...	...
Chicago, Ill., to Toledo, Ohio.	243	1,458	Thrice daily	3	16	28	16	2	...
Chicago, Ill., to Burlington, Iowa.	207	828	Twice daily	8	8	15	2	1	...
Chicago to Freeport, Ill.	121	242	Daily	...	4	4	...	...	...
Chicago, Ill., to Cincinnati, Ohio.	310	620	do	6	6	3	6	...	...
Chicago, Ill., to Iowa City, Iowa.	237	474	do	4	4	1	1	...	...
Chicago, Ill., to Cedar Rapids, Iowa.	219	876	Twice daily	10	7	2	1	...	...
Chicago to Centralia, Ill.	252	504	Daily	5	4	2	...	...	...
Chicago, Ill., to Saint Louis, Mo.	280	560	do	2	4	2	2	...	...
Chicago, Ill., to Davenport, Iowa.	183	366	do	...	4	4	...	...	...
Chicago, Ill., to Dubuque, Iowa.	202	404	do	...	4	3	1	...	...
Chicago, Ill., to Sparta, Wis.	255	510	do	2	5	19	5	1	...
Chicago to Tolono, Ill.	137	274	do	...	2	5	1	...	...
Cleveland to Cincinnati, Ohio.	244	488	do	1	6	5	1	1	...
Cleveland, Ohio, to Indianapolis, Ind.	282	564	do	3	1	2	1	...	...
Cincinnati, Ohio, to Saint Louis, Mo.	340	680	do	3	4	1	1	...	...
Detroit, Mich., to Chicago, Ill.	284	568	do	4	6	1	...	...	...
Grafton, W. Va., to Cincinnati, Ohio.	300	600	do	5	3	1	1	...	...
Grafton, W. Va., to Chicago, Ill.	559	1,118	do	1	6	7	2	...	...
Galveston to Quincy, Ill.	99	198	do	2	3	1	...	...	...
Hannibal, Mo., to Denison, Tex.	576	1,152	do	10	3	1	2	...	...
Indianapolis, Ind., to Saint Louis, Mo.	261	522	do	3	2	2	...	...	...
La Fayette, Ind., to Quincy, Ill.	273	546	do	1	4	8	1	...	...
Louisville, Ky., to Nashville, Tenn.	185	370	do	1	6	11	5	1	...
Lynchburg, Va., to Bristol, Tenn.	203	406	do	1	3	2	2	...	...
Louisville, Ky., to Milan, Tenn.	284	568	do	3	2	1	...	...	...
New Orleans, La., to Cairo, Ill.	548	1,096	do	1	6	7	2	1	...
New York, N. Y., to Boston, Mass.	234	1,404	Thrice daily	2	13	18	6	...	...
New York, N. Y., to Boston, Mass., via Providence.	230	460	Daily	...	...	...	...	...	...
New York, N. Y., to Washington, D. C., and short line.	232	928	Twice daily	3	11	15	8	4	1
New York to Dunkirk, N. Y.	90	180	Daily	...	...	...	...	...	...
New York to Dunkirk, N. Y.	459	1,836	Twice daily	1	14	12	10	5	...
New York to Albany, N. Y.	144	864	Thrice daily	3	5	5	1	...	...
New York, N. Y., to Pittsburgh, Pa.	444	2,664	do	1	12	11	...	...	...
Omaha, Nebr., to Ogden, Utah.	1,032	2,064	Daily	2	5	13	15	...	...
Pittsburgh, Pa., to Saint Louis, Mo.	620	2,480	Twice daily	16	19	11	5	...	...
Pittsburgh, Pa., to Cincinnati, Ohio.	313	626	Daily	5	10	1	4	...	...
Pittsburgh, Pa., to Chicago, Ill.	469	938	do	1	7	7	5	...	...
Quincy, Ill., to Kansas City, Mo.	261	522	do	...	4	4	1	...	...
San Francisco, Cal., to Ogden, Utah.	895	1,790	do	1	10	12	3	2	...
Saint Louis, Mo., to Atchison, Kans.	330	1,320	Twice daily	4	9	17	2	3	...
Saint Louis, Mo., to Texarkana, Ark.	490	980	Daily	1	11	1	...	...	...
Toledo, Ohio, to La Fayette, Ind.	303	406	do	...	5	5	...	...	...
Washington, D. C., to Petersburg, Va.	155	620	Twice daily	3	9	19	7	2	...
Washington, D. C., to Danville, Va.	243	486	Daily	4	1	3	1	...	...
	17 340	48,954		41	356	443	178	69	1

165

[illegible]

RECAPITU

Recapitulation and comparative statement of the

Number of lines of railway post-offices	
Aggregate number of miles of the above	
Number of miles of actual service performed daily	
Number of miles of actual service performed annually	
Number of head clerks at \$1,400 per annum	
Number of head clerks at \$1,300 per annum	
Number of head clerks at \$1,150 per annum	
Number of assistant clerks at \$1,000 per annum	
Number of assistant clerks at \$900 per annum	
Number of assistant clerks at \$840 per annum	
Number of assistant clerks at \$800 per annum	
Number of assistant clerks at \$500 per annum	
Total number of clerks	
With annual compensation amounting to	
Net increase in compensation	
Net increase in clerks	

LATION.

service on June 30, 1878, and June 30, 1879.

June 30, 1878.	June 30, 1879.	Increase.	Decrease.
59	59		
16,980	17,340	360	
49,134	48,954		180
17,933,910	17,868,210		65,700
30	41	2	
343	356	13	
419	443	24	
275	178		97
1	69	68	
1	1		
	2	2	
3	1		2
1,081	1,091	100	90
\$1,200,500	\$1,272,290		
		\$11,700	
		10	

THOS. J. BRADY,
Second Assistant Postmaster-General.

K.—Railway post-office lines, route-agents, and mail-route messenger

(Consolidated statement as given in tables K and L of

Number of route.	Contract designation, terminus of route.	Corporate title of company.	Railway mail service, designation.	Railway post-office, route-agent, or mail-route messenger.	Distance.
					<i>Miles.</i>
1	Augusta, Skowhegan	Maine Central	Skowhegan and Portland.	R. A.	19
3	Farmington, Brunswick.	.....do	Bath and Lewiston ...	R. A.	23
4	Belfast, Burnham Village.	.....do	Belfast and Burnham Village.	M. R. M.	24
5	Portland, Bangor	.....do	Skowhegan and Portland.	R. A.	84
			North Anson and Lewiston.	R. A.	42
			Farmington and Lewiston.	R. A.	10
6	Portland, Augusta	.....do	Augusta and Portland.	R. A.	62
	Branch, Bath, Brunswick.	.....do	Rockland and Brunswick.	R. A.	9
7	Portland, Canada line.	Grand Trunk.....	Bath and Lewiston ...	R. A.	8
			Portland and Island Pond.	R. A.	149
			Portland and Shelburne.	R. A.	86
8	Portland, Rochester...	Portland and Rochester ...	Portland and Worcester	R. A.	52
9	Portsmouth, Portland.	Eastern.....	Portland and Rochester	R. A.	52
			North Conway and Boston.	R. A.	11
10	Portland, Lunenburg Station.	Portland and Ogdensburg	Portland and Swanton .	R. A.	81
			Portland and Fryeborough.	R. A.	55
11	Boston, Portland	Boston and Maine	Portland and Boston...	R. P. O.	116
3011			Vanceborough and Bangor.	R. P. O.	118
12	Bangor, Vanceborough	Consolidated European and North American.	Bangor and Bucksport	M. R. M.	16
13	Bangor, Bucksport....	.....do	Blanchard and Old Town.	R. A.	63
14	Blanchard, Old Town	.....do	Rockland and Brunswick.	R. A.	49
15	Bath, Rockland	Knox and Lincoln	North Anson and Lewiston.	R. A.	20
18	West Waterville, North Anson.	Somerset	Lancaster and Boston..	R. A.	18
1001	Concord, Nashua.....	Concord	Manchester and Peterborough.	R. A.	18
			Pittsfield and Lawrence	R. A.	9
1002	Concord, Portsmouth	.....do	Portsmouth and Manchester.	R. A.	41
1004	Hooksett, Pittsfield...	.....do	Pittsfield and Lawrence	R. A.	26
1005	Concord, Wells River.	Boston, Concord and Montreal.	Lancaster and Boston..	R. A.	89
			Plymouth and Concord.	R. A.	51
1006	Groveton, Wells River	Boston, Concord, and Montreal, and White Mountains.	Lancaster and Boston..	R. A.	42
			Portland and Swanton .	R. A.	9
1009	Concord, Claremont...	Concord and Claremont.....	Concord and Claremont	R. A.	56
			Manchester and Peterborough.	R. A.	12
1010	Contoocook Village, Peterborough.	.....do .....	.....do	R. A.	33
1012	Nashua, Rochester....	Nashua and Rochester.....	Portland and Worcester	R. A.	49
1018	Dover, Alton Bay	Boston and Maine	Alton Bay and Dover..	M. R. M.	24
	Wing Road, Fabyan House.	Boston, Concord and Montreal.	Portland and Swanton .	R. A.	14
1014	Brook's Crossing, North Conway.	Conway Division of Eastern	North Conway and Boston.	R. A.	79
2001	Burlington, Rouse's Point.	Central Vermont	Saint Armands and Essex Junction.	R. A.	17
			Essex Junction and Boston.	R. A.	8

service in operation in the United States on the 30th of June, 1879.

Second Assistant Postmaster-General's report of 1878.)

Annual miles of serv- ice.	Number of round trips with clerks or agents per week.	Number of railway post-office cars or cars in which there are mail apartments.	Dimension of cars or apart- ments.		Day or night service.	Number of round trips per week by express mail over whole route.	Number of round trips per week over portion of route, and between what points.
			Length.	Width.			
11,894	6	2	16 0	7 0	Day		6, Skowhegan to Waterville.
28,796	12	1	12 0	6 9	do		12, Brunswick to South Lewis- ton; 12, Brunswick to Lewis- ton.
21,264	6	1	7 6	10 0	do		6, Belfast to Knox Station.
52,584	6	1	12 6	6 7	do		6, Fairfield to Portland.
26,292	6	1	12 6	6 7	do		6, Lewiston to West Water- ville.
6,260	6	1	16 7	6 9	Reserve		6, Farmington and Leeds Junc- tion.
38,812	6	4	15 0	6 6	Day		
11,268	12	1	12 0	6 6	do	6	
10,016	12	1	15 6	6 8	do		
93,274	6	1	19 0	7 7	do		
53,836	6	3	17 6	7 6	do		
		2	20 8	7 0	Reserve		
32,552	6	1	12 0	6 6	Day		
16,276	3	1	10 8	7 0	do		
6,886	6	1	18 0	6 0	do		6, Portsmouth and Brock's Crossing.
56,906	6	2	13 6	6 7	do		
34,430	6	2	13 6	6 7	do		
145,232	12	2	25 2	8 6	do		
		1	25 2	8 6	Reserve		
73,868	6	2	21 0	9 6	Day	6	
		2	21 0	9 6	Reserve		
20,032	12	1	18 0	8 0	Day		
		1	18 0	9 0	Reserve		
39,438	6	1	14 0	9 0	Day		
		1	9 0	6 8	Reserve		
61,348	12	1	14 6	7 2	Day		
12,520	6	1	12 6	6 7	do		
11,268	6	2	16 9	6 8	do		
11,268	6	2	12 0	7 0	Reserve		
5,634	6						
51,382	12	1	12 6	6 7	Day	3	
		1	9 0	6 9	Reserve		
12,520	6	1	7 0	4 6	Day		
55,714	6	2	16 9	6 8	do	6	
31,926	6	2	12 0	7 0	Reserve		
26,292	6	2	16 9	6 8	Day	6	6, Wells River to Lancaster.
5,634	6	2	13 6	6 7	do		6, Wing Road to Lunenburg.
		2	12 0	7 0	Reserve		
35,056	6	2	16 9	6 8	Day		
7,512	6	2	12 0	7 0	Reserve		
20,658	6	1	7 0	6 0	Day		
		1	12 0	6 6	do		
61,348	12	1	10 8	7 0	do		
35,056	12	1	9 4	6 6	do		
8,764	6	2	13 6	6 7	do	3	
87,640	12	1	18 1	6 0	do		
10,642	6	3	20 7	8 7	do		6, Essex Junction and Saint Albans.
5,008	6	1	23 9	6 6	do		6, Burlington and Essex Junc- tion.



K.—*Railway post-office lines, route-agents, and mail-route messenger service in*

Number of route.	Contract designation, termini of route.	Corporate title of company.	Railway mail service, designation.	Railway post-office, route-agent, or mail-route messenger.	Distance.
					Miles.
2002	Windsor, Burlington..	Central Vermont.....	Newport and Springfield.	R. A.	14
2002	Windsor, Burlington..	.....do	White River Junction and Springfield.	R. A.	14
2003	Bellows Falls, Burlington.	.....do	Essex Junction and Boston.	R. A.	54
2004	Bellows Falls, Windsor.	.....do	White River Junction and Springfield.	R. A.	25
2005	Brattleboro', Bellows Falls.	Vermont Valley.....	Newport and Springfield.	R. A.	49
			White River Junction and Springfield.	R. A.	24
2006	Saint Albans, Canada Line.	Central Vermont.....	Saint Armands and Essex Junction.	R. A.	17
2007	Saint Albans, Richford.	} Southeastern	{ Newport and Saint Albans.	R. A.	28
2009	Richford, Newport....			R. A.	31
2010	White River Junction, Derby Line.	Connecticut and Passamaquoddy River and Massawip Valley.	Newport and Springfield.	R. A.	106
2011	Lunenburg Junction, Swanton.	Vermont Division Portland and Ogdensburg.	Portland and Swanton.	R. A.	120
2012	Wells River, Montpelier.	Montpelier and Wells River.	Wells River and Montpelier.	M. R. M.	38
2014	Burlington, Cambridge Junction.	Burlington and Lamotte....	Cambridge Junction, Burlington.	R. A.	35
2015	Rutland, Bennington..	} Bennington and Rutland.. } Troy and Bennington } Branch Troy and Boston. }	} Rutland and Hoosick } Junction. }	} R. A.	58
	Branch, North Bennington, State Line.				
3001	Boston, Portsmouth...	Eastern.....	North Conway and Boston.	R. A.	56
	Boston, Saint Albans..	Central Vermont, North (N. H.) Concord, Nashua and Lowell, and Boston and Lowell.	Saint Albans and Boston.	R. P. O.	290
3011	Boston, Salmon Falls..	Boston and Maine.....	Lancaster and Boston..	R. A.	26
3020	Ayer, Lowell	Boston and Lowell, and Nashua and Lowell.	Lowell and Ayer.....	M. R. M.	17
3021	Boston, Fitchburgh...	Fitchburgh	Essex Junction and Boston.	R. A.	50
3021	} Boston, Troy.....	} Fitchburgh, Vermont and Massachusetts Division of Fitchburgh, Troy and Greenfield, and Troy and Boston.	} Boston and Troy.....	} R. P. O.	192
3022					
3024	Ayer, Greenville.....	Fitchburgh	Greenville and Boston.	R. A.	56
3025	Boston, Albany	Boston and Albany	Boston, Clinton, and Fitch.	R. A.	21
3025	Boston, Albany.....	Boston and Albany	Boston and Albany	R. P. O.	202
	Boston, Wellfleet	Old Colony.....	Boston and Wellfleet...	R. P. O.	122
	Boston, Bangor	Maine Central and Eastern .	Bangor and Boston	P. P. O.	240
3030	Palmer, Winchendon .	Boston and Albany	Winchendon and Palmer	R. A.	40
3034	Boston, Southbridge..	} New York & New England }	} Boston and Willimantic } Boston and Waterbury. }	} R. A.	53
3035	Boston, Providence ...				
		Boston and Providence.....	Boston and Providence.	R. A.	44

operation in the United States on the 30th of June, 1879—Continued.

Annual miles of service.	Number of round trips with clerks or agents per week.	Number of railway post-office cars or cars in which there are mail apartments.	Dimension of cars or apartments.		Day or night service.	Number of round trips per week by express mail over whole route.	Number of round trips per week over portion of route, and between what points.
			Length.	Width.			
			<i>Ft. In.</i>	<i>Ft. In.</i>			
8,764	6	1	15 0	6 2	Reserve		6, Windsor and White River Junction.
		1	21 8	6 6	Day		
8,768	6	1	21 10	6 6	Day		
		1	21 8	7 0	Reserve		
33,804	6	1	23 6	7 0	Day		9
		1	15 9	6 8	Reserve		
15,650	6	1	21 10	6 6	Day		
30,674	6	2	21 3	7 0	Reserve	6	6, White River Junction and Newport.
		1	21 10	6 6	Day		
15,024	6	1	23 9	6 6	do		
10,642	6	1	13 0	7 0	do		
17,528	6	2	10 8	5 5	do		6, Rutland and North Bennington.
19,406	6	1	13 10	7 0	Reserve		
		1	13 0	7 0	Day		
66,356	6	1	11 6	6 4	Day		
		2	13 6	6 7	Day		6
75,120	6	1	11 5	6 5	Day		
33,788	6	1	12 0	7 0	Reserve		
		1	8 8	6 9	Day		
43,820	12	1	7 0	6 7	Reserve		6
		2	18 0	6 8	Day		
36,308	6	2	18 0	6 8	do		
		1	18 0	6 6	do		
35,056	6	2	20 0	8 7	do		6
		1	41 9	8 7	do		
363,660	12	1	42 5	8 9	do		
		1	40 5	8 9	do		
		1	23 9	6 6	do		6
		1	21 7	6 9	Reserve		
		1	25 0	7 0	Day		
16,276	6	2	16 9	6 8	Reserve		
		2	12 0	7 0	Day		6
21,284	12	1	8 7	6 9	Reserve		
		1	6 0	3 7	Day		
31,300	6	1	23 6	7 0	Reserve		
		1	28 0	6 6	do		6
		1	23 0	6 9	do		
		1	23 6	7 0	Reserve		
		1	15 9	6 8	do		
360,576	18	2	30 0	8 9	Night		6
		4	15 10	8 7	Day		
		2	17 0	7 0	Reserve		
		1	15 0	6 2	Night		
		2	30 0	5 0	Day		6
		1	18 0	6 6	do		
		1	14 0	6 6	do		
		1	17 6	6 4	Reserve		
36,308	6	2	15 0	6 2	do		6
13,146	6	1	6 6	6 0	Day		
		1	14 0	6 9	Day		
254,156	12	4	27 7	8 7	Day	6	9, Boston to Springfield. 6, Boston to Worcester. 3, Boston to Wollaston. 12, Boston to Quincy.
		1	27 7	8 7	Reserve		
152,744	12	2	14 0	8 4	Day		
		1	10 2	6 6	do		
		1	10 2	6 6	Reserve		6
311,748	12	1	42 0	8 7	Day		
		1	40 0	8 7	Night		
		2	30 0	8 7	Reserve		
30,674	6	1	10 3	6 5	Day	6	6, Boston and Ware. 6, Boston to East Thompson.
32,552	6	1	12 7	6 9	do		
32,552	6	1	16 0	6 6	Reserve		
55,068	12	3	14 8	6 0	Day	27	

K.—*Railway post-office lines, route-agents, and mail-route messenger service in*

Number of route.	Contract designation, termini of route.	Corporate title of company.	Railway mail service, designation.	Railway post-office, route-agent, or mail-route messenger.	Distance.
					<i>Miles.</i>
3035	New York, Boston	Boston and Providence, New York, Providence and Boston, and New York, New Haven and Hartford.	Boston, Providence and New York.	R. P. O.	230
	Do.....	New York, New Haven and Hartford, and Boston and Albany.	Boston, Springfield and New York.	R. P. O.	284
3046	Pratt's Junct'n, South Framingham.	Northern Division Old Colony.	Boston, Clinton and Fitchburgh.	R. A.	29
3047	Sterling Junction, Fitchburgh.	.....do	Lowell and Mansfield..	R. A.	35
3048	Mansfield, South Framingham.	.....do .....	.....do	R. A.	21
3049	South Framingham, Lowell.	Boston, Clinton and Fitchburgh.	Essex Junction and Boston.	R. A.	28
3055	Fitchburgh, Bellows Falls.	Cheshire.....	Keene and Springfield.	R. A.	64
3056	South Vernon Junction, Keene.	Ashuelot.....	Peterboro' and Worcester.	R. A.	24
3057	Winchendon, Worcester.	Boston and Barre and Gardiner.	Winchendon and Worcester.	R. A.	37
3058	Winchendon, Peterboro'.	.....do	Peterboro' and Worcester.	R. A.	37
3061	Palmer, Miller's Falls.	Central Vermont.....	Peterboro' and Worcester.	R. A.	16
			Brattleboro' and Palmer	R. A.	35
3062	Miller's Falls, Brattleboro'.	}.....do .....	.....do	R. A.	21
			Newport and Springfield	R. A.	13
			White River Junction and Springfield.	R. A.	13
3063	Lawrence, Manchester	Manchester and Lawrence..	Lancaster and Boston..	R. A.	26
			Pittsfield and Lawrence	R. A.	26
3066	Worcester, Nashua ...	Worcester and Nashua ...	Nashua and Worcester.	R. A.	46
3067	Springfield, South Vernon Junction.	Connecticut River	Portland and Worcester	R. A.	46
			Newport and Springfield	R. A.	50
			White River Junction and Springfield.	R. A.	50
3068	Springfield, Athol	Springfield, Athol and Northeastern.	Athol and Springfield..	R. A.	48
4001	Providence, Worcester	Providence and Worcester..	Worcester and Providence.	R. A.	43
4002	Providence, New London.	New York, Providence and Boston.	Providence and New London.	R. A.	64
5001	Norwich, Worcester ..	New York and New England.	Worcester and Norwich	R. A.	59
5002	East Thompson, Willimantic.	.....do	Boston and Willimantic	R. A.	33
			Boston and Waterbury.	R. A.	33
5004	New Haven, New London.	Shore Line Division New York, New Haven and Hartford.	New London and New Haven.	R. A.	51
5005	New Haven, Springfield.	New York, New Haven and Hartford.	Springfield and New York.	R. A.	135
5006	New Haven, New York	.....do	New Haven and New York.	R. A.	74
5007	Waterbury, Providence.	Hartford, Providence and Fitchkill.	Providence and Waterbury.	R. A.	122

operation in the United States on the 30th of June, 1879—Continued.

Annual miles of service.	Number of round trips with clerks or agents per week.	Number of railway post-office cars or cars in which there are mail apartments.	Dimension of cars or apartments.		Day or night service.	Number of round trips per week by express mail over whole route.	Number of round trips per week over portion of route, and between what points.
			Length.	Width.			
143,980	6	2	<i>Ft. In.</i> 55 0	<i>Ft. In.</i> 8 9	Night.....		
439,452	18	4	55 0	8 9	Day		3, Boston to Newton; 3, Boston to Natick; 3, Boston to Grafton.
18,154	6	1	55 0	8 9	do		6, Pratt's Junction and Fitchburgh.
21,910	6	1	27 7	8 7	do		
26,292	12	1	12 0	6 6	do		
		1	12 0	6 10	do		
17,528	6	1	10 6	6 9	Reserve		
		1	12 0	6 10	Day	6	
40,064	6	1	10 6	6 9	Reserve		
		1	23 6	7 0	Day	12	
		1	28 0	6 6	do		3, Fitchburgh to Keene.
		1	23 0	6 9	do		
		1	33 6	7 0	Reserve		
		1	15 9	6 8	do		
15,024	6	1	18 0	6 9	Day	6	
23,162	6	1	13 10	3 0	Reserve		
23,162	6	1	8 4	6 2	Day		
		1	10 0	7 6	do		
10,016	6	2	8 0	5 6	do		
		1	14 0	3 0	Reserve		
21,910	6	1	10 6	6 6	Day		6, Palmer to Amherst.
		3	10 4	6 6	Reserve		
13,146	6	1	22 9	7 1	Day		
8,138	6	1	21 3	7 0	do		
8,138	6	2	21 10	6 6	Reserve		
16,276	6	3	12 0	7 0	Day		
16,276	6	2	7 0	4 6	do		
		1	12 0	7 6	Reserve		
		2	10 1	6 9	do		
57,592	12	1	12 0	6 6	Day	3	6, Sterling Junct'n to Worcester.
28,796	6	1	10 8	7 0	do		3, Ayer to Worcester.
31,300	6	1	11 6	6 4	do		
31,300	6	1	13 0	7 0	do		24, Springfield to Chicopee.
		1	11 5	6 5	do		9, Springfield to Northampton.
		1	22 9	7 0	do		9, Springfield to Holyoke.
30,048	6	1	11 6	6 9	do		
		1	11 8	6 4	Reserve		
53,836	12	1	18 2	6 4	Day		3, Providence to Blackstone.
		2	14 0	7 0	do		
40,064	6	1	16 0	6 9	do		
78,868	12	2	12 7	6 9	do	9	
		1	16 0	6 6	Reserve		3, Willimantic to Putnam.
26,652	6	1	25 2	8 9	Day	12	
26,652	6	1	26 0	8 9	do		
		1	12 0	6 0	Reserve		
31,926	6	1	25 2	8 9	Day		
		1	23 0	8 9	do		
		1	12 0	6 0	Reserve		
		1	26 2	8 6	Day		
34,510	6	1	45 8	8 8	do	12	
46,324	6	1	14 10	6 0	do	21	3, Bridgeport to New Haven.
		1	35 10	8 10	do		
		1	12 0	6 0	Reserve		
76,372	6	2	14 0	6 6	Day		
		2	14 0	6 6	Reserve		
		1	12 9	6 6	Day		

K.—Railway post-office lines, route-agents, and mail-route messenger service in

Number of route.	Contract designation, termini of route.	Corporate title of company.	Railway mail service, designation.	Railway post-office, route-agent, or mail-route messenger.	Distance.
					Miles.
5009	New London, Palmer..	New London Division and Northern of Central Vermont.	Palmer and New London.	R. A.	65
5010	New Haven, Williamsburgh.	New Haven and Northampton.	Williamsburgh and New Haven.	R. A.	84
	Branch, New Hartford, Farmington.	do	New Haven and Farmington.	M. R. M.	14
5011	Bridgeport, West Winsted.	Naugatuck	West Winsted and Bridgeport.	R. A.	61
5012	Bridgeport, Pittsfield.	Housatonic	Pittsfield and Bridgeport.	R. A.	110
5013	Danbury, South Norwalk.	Danbury and Norwalk	Danbury and South Norwalk.	R. A.	23
5014	New Haven, Willimantic.	Northampton, Willimantic and Middletown.	Willimantic and New Haven.	R. A.	54
5015	Hartford, Saybrook Point.	Connecticut Valley	Springfield and Saybrook Point.	R. A.	43
5016	Springfield, Hartford..	Connecticut Central			30
5018	Hartford, Millerton ..	Connecticut Western	Hartford and Millerton.	R. A.	60
5019	Litchfield, Hawleyville Branch, Bethel, Hawleyville.	Shepang	Litchfield and Bethel.	M. R. M.	32
		Danbury and Norwalk ..		M. R. M.	6
6001	New York, Dunkirk ..	New York, Lake Erie and Western.	New York and Dunkirk	R. P. O.	459
			Port Jervis and New York.	R. A.	87
6002	Suffern, Piermont	Piermont Branch New York, Lake Erie and Western.	Mousey and New York.	R. A.	40
7017	New York, Nyack	Northern of New Jersey.			
6005	Rochester, Avon	Danville Branch and Mount Morris Branch of New York, Lake Erie and Western.	Danville and Buffalo ..	R. A.	96
6006	Avon, Dansville	Rochester and Batavia Branch New York, Lake Erie, and Western.	Rochester and Corning.	R. A.	94
6007	Attica, Corning				
6008	Buffalo, Hornellsville.	Buffalo Division New York, Lake Erie and Western.	Hornellsville and Buffalo.	R. A.	71
6009	Goshen, Montgomery ..	Montgomery Branch New York, Lake Erie and Western.	Rondout and Goshen.	R. A.	53
6083	Montgomery, Kingston	Walkill Valley			
6011	New York, Albany	New York Central and Hudson River.			144
6017	Albany, Buffalo				228
6052	Buffalo, Cleveland ..				183
	Cleveland, Elyria				28
	Elyria, Millbury	Lake Shore and Michigan Southern.	New York and Chicago.	R. P. O.	79
	Millbury, Toledo				8
	Toledo, Elkhart				142
	Elkhart, Chicago				101
6052	Toledo, Elkhart	do	Grand Rapids and Elkhart.	R. A.	19
6017	Albany, Buffalo	New York Central and Hudson River.	Albany and Rochester.	R. P. O.	229
6013	Syracuse, Rochester ..	do	Syracuse and Rochester	R. A.	106
6014	Canandaigua, Tonawanda.	do	Canandaigua and Batavia.	R. A.	88
			Batavia and Tonawanda.		

operation in the United States on the 30th of June, 1879—Continued.

Annual miles of service.	Number of round trips with clerks or agents per week.	Number of railway post-office cars or cars in which there are mail apartments.	Dimension of cars or apartments.		Day or night service.	Number of round trips per week by express mail over whole route.	Number of round trips per week over portion of route, and between what points.
			Length.	Width.			
			<i>Ft. In.</i>	<i>Ft. In.</i>			
40,690	6	1	11 4	6 6	Day	9	6, Norwich to New London.
		1	10 8	6 4	Reserve		3, New London to Willimantic.
		1	11 5	6 5	Day		
		1	9 9	6 5	Reserve		
105,168	12	2	15 4	6 9	Day		
17,528	12	1	11 6	6 7	do		
		1	10 0	6 6	Reserve		
76,372	12	1	16 0	5 10	Day		
		1	16 0	6 4	do		
		1	11 7	6 2	Reserve		
137,720	12	2	14 6	6 6	Day		
		2	6 6	6 2	do		
		1	14 6	5 6	Reserve		
28,796	12	1	11 2	6 0	Day	12	
		1	11 8	5 11	Reserve		
		1	7 10	5 10	do		
33,804	6	1	9 8	6 6	Day	18	6, New Haven to Middletown.
26,918	6	1	10 6	6 9	do		
18,780	6	1	11 6	6 9	Reserve		
		1	7 6	7 0	do		
75,120	12	2	12 0	6 0	Day		
		1	12 0	6 0	Reserve		3, Canaan to Millerton.
20,032	6	1	9 4	6 6	Day		7, New York to Hornellsville.
3,756	6	1	9 4	6 6	Day		
576,700	7	6	45 5	9 5	Day and night		6, Hornellsville to Dunkirk; 6, New York to Hornellsville.
54,462	6	1	16 6	6 10	Day	3	6, Olean to Carrollton; 9, New York to Patterson; 6, Salamanca to Hornellsville; 6, New York to Goshen.
25,040	6	1	9 0	7 0	Day		6, New York to Nyack.
		1	5 0	7 0	Reserve		
60,096	6	1	11 5	5 10	Day	12	6, Avon to Buffalo; 6, Avon to Dansville; 6, Rochester to Dansville.
58,844	6	1	13 11	9 3	do	9	6, Rochester to Dansville.
44,446	6	1	14 0	9 0	do	12	3, Rochester to Elmira.
		1	14 0	9 6	do		
33,178	6	1	9 7	7 0	do		9, Montgomery to Goshen.
300,384	20	1	15 0	8 0	Day and night		6, Walden to Montgomery
621,628	20	4	60 0	9 0	do		
381,738	20	4	50 0	9 0	do		
70,512	26	1	49 5	9 0	do		
115,340	14	4	45 10	9 0	do		
21,606	26	2	49 5	9 0	do		
177,784	12	2	60 0	9 0	do		
273,912	26	2	50 0	9 0	do		
11,894	6	3	60 0	9 0	do		
		1	16 0	9 0	Day		
143,354	6	2	60 0	9 0	do		6, New York to Poughkeepsie.
		2	47 4	8 10	do		6, New York to Peekskill.
		1	44 10	8 8	do		27, New York to Tarrytown.
		2	47 8	8 10	Reserve		6, Little Falls to Illion.
64,478	6	2	44 9	8 7	do	6	21, New York to Albany.
		1	18 0	9 0	Day	24	
53,836	6	3	5 9	6 0	do		

K.—*Railway post-office lines, route-agents, and mail-route messenger service*

Number of route.	Contract designation, termini of route.	Corporate title of company.	Railway mail service, designation.	Railway post-office, route-agent, or mail-route messenger.	Distance.
6018	Rochester, Niagara Falls.	New York Central and Hudson River.	Rochester and Niagara Falls.	R. A.	77
6019	Dunkirk, Titusville...	Dunkirk, Allegheny Valley and Pittsburgh.	Dunkirk and Titusville	R. A.	91
6022	New York, Chatham Village.	New York and Harlem	Chatham Village and New York.	R. A.	128
	New York, Pawling ..	.....do	Pawling and New York	R. A.	64
6024	Eagle Bridge, Rutland	Delaware and Hudson Canal Company.	{ Rutland, Salem and Troy.	R. A.	85
6067	Troy, North Adams Branch, Hoosick Junction, State Line.	Troy and Boston		R. A.	5
6026	Albany, Canada line ..	{ Delaware and Hudson Canal Company.	Rutland and Hoosick Junction.	R. A.	190
6033	West Chazy, Rouse's Point.		Rouse's Point and Albany.	R. A.	182
6034	Oswego, Richland	{ Rome, Watertown and Ogdensburg.	Richland and Niagara Falls.	R. A.	142
6038	Oswego, Lewiston		Ogdensburg and Rome	R. A.	45
6036	Rome, Ogdensburg ..	.....do	Richland and Syracuse.	R. A.	95
6037	Syracuse, Lacona .....	.....do	{ Utica and Binghamton	R. A.	33
6040	Chenango Falls, Norwich.	Utica Division of Delaware, Lackawanna and Western.		R. A.	94
6041	Utica and Norwich .....	.....do	{ Ithaca and Oswego	R. A.	69
6042	Owego and Ithaca	Cayuga Division of Delaware, Lackawanna and Western.		R. A.	25
6045	New York, Greenport.	Long Island	Greenport and New York.	R. A.	249
6046	Hicksville, Port Jefferson.	.....do	Port Jefferson and Hicksville.	R. A.	142
6047	Manorville, Sag Harbor.	.....do	Sag Harbor and Manorville.	R. A.	55
6048	Oswego, Middletown..	New York and Oswego Midland.	Oswego and Norwich } Norwich and Middle- town.	R. A.	22
6053	Rouse's Point, Ogdensburg.	Ogdensburg and Lake Champlain.	Saint Albans and Ogdensburg.	R. A.	55
6054	Chatham Village, Rutland.	Harlem Extension	Bennington and Chatham Village.	R. A.	32
6057	Utica, Smith Valley Station.	Utica, Clinton and Binghamton.	Utica and Randolphville.	R. A.	121
6058	Buffalo, Emporium	Buffalo, New York and Philadelphia.	Buffalo and Emporium.	R. A.	44
6061	Brocton, Corry	Buffalo, Chautauque Lake and Pittsburgh.	Brocton and Corry	R. A.	147
6063	Canandaigua, Elmira..	{ Northern Central	{ Canandaigua and Elmira Elmira and Williamsport.	R. A.	25
3021	Williamsport, Elmira.			R. A.	89
6064	Syracuse, Oswego	Delaware, Lackawanna and Western.	Oswego and Syracuse..	R. A.	63
6065	Syracuse, Binghamton.	Syracuse, Binghamton and New York.	Syracuse and Binghamton.	R. A.	22
6071	Syracuse, Earlville	Syracuse and Chenango	Syracuse and Earlville.	R. A.	22
6072	Lyons, Sayre	Geneva, Ithaca and Sayre ..	Lyons and Sayre	R. A.	74
6073	Rondout, Stamford ..	Ulster and Delaware	Rondout and Stamford.	R. A.	

in operation in the United States on the 30th of June, 1879—Continued.

Annual miles of serv. ice.	Number of round trips with clerks or agents per week.	Number of railway post-office cars or cars in which there are mail apartments.	Dimension of cars or apart- ments.		Day or night service.	Number of round trips per week by express mail over whole route.	Number of round trips per week over portion of route, and between what points.
			Length.	Width.			
48,202	6	1	<i>Ft. In.</i> 30 0	<i>Ft. In.</i> 8 4	Day.....	18	
56,966	6	1	12 0	7 0	do.....	6	
80,128	6	2	20 4	8 4	do.....		6, Dover Plains to Millerton.
40,064	6	1	19 10	8 2	Reserve.....		14, New York to White Plains;
			18 2	8 5	Day.....	6	26, New York to Fordham; 6, New York to Golden's Bridge.
53,210	6	1	12 3	6 7	do.....		6, Rutland to Castleton.
		1	13 3	6 9	Shop.....		6, Eagle Bridge to Rutland.
3,130	6	3	18 0	6 8	Day.....		
118,940	6	2	21 7	7 0	Day and night.....		12, Albany to Rutland; 6, Al- bany to Whitehall.
113,932	6	2	23 6	7 2	Day.....		12, Oswego to Richland; 3, Wel- lington to Charlotte.
88,892	6	1	24 6	7 2	do.....	9	6, Rome to Watertown.
28,170	6	2	22 10	6 9	Reserve.....		18, De Kalb Junction to Nor- wood.
		1	9 0	7 0	Day.....	12	
		1	9 0	7 0	Reserve.....		
		1	17 0	7 2	Day.....	9	
59,470	6	1	17 3	6 7	Reserve.....		
20,658	6	1	7 9	6 8	Day.....	6	3, Utica to Richfield Junction.
		1	9 4	3 4	Reserve.....		
58,844	6	2	10 6	5 8	Day.....	6	6, Mineola to Hempstead.
43,194	6	1	12 0	6 6	Day.....		6, Northport to
		1	14 0	8 0	do.....		
21,910	6	1	12 6	6 0	Day.....	6	
155,874	6	1	10 0	7 0	do.....		6, Middletown to Summitville.
		1	10 9	7 6	do.....		3, East Guilford to Guilford Centre.
		1	13 4	6 4	do.....		3, Sidney Plains to Walton.
		1	12 4	7 2	do.....		
		1	14 4	7 2	do.....		
		1	18 0	7 4	Shop.....		
88,892	6	2	13 4	6 10	Day.....		6, Rouse's Point to Saint Al- bans.
		1	11 2	7 6	Reserve.....		3, Rouse's Point to Ogdens- burgh.
34,430	6	1	14 2	7 1	Day.....		6, Chatham Village to Lebanon.
20,032	6	1	15 0	6 11	do.....	6	
75,746	6	1	13 2	7 1	do.....		6, Buffalo to Sardina Junction.
		1	11 8	6 2	Shop.....		
27,544	6	1	12 0	5 10	Day.....		6, Corry to Mayville.
		1	12 5	5 11	do.....		
92,022	6	1	14 6	8 6	Day.....		6, Canandaigua to Williamsport.
		2	15 6	8 6	do.....		6, Elmira to Williamsport.
		2	15 0	8 6	do.....		
		2	14 6	8 6	Reserve.....		
21,910	6	2	14 10	6 8	Day.....	12	
50,080	6	1	18 6	7 6	do.....	12	
		1	18 6	7 6	Reserve.....		
26,918	6	2	8 0	6 0	Day.....		12, Syracuse to Cazenovia.
57,592	6	1	7 6	7 0	do.....		6, Trumansburgh to Geneva.
		1	7 6	7 0	Reserve.....		
		1	6 6	6 6	do.....		
46,324	6	1	12 6	6 11	Day.....		
		1	8 7	6 3	do.....		
		1	12 0	6 11	Reserve.....		

K.—*Railway post-office lines, route-agents, and mail-route messenger service in*

Number of route.	Contract designation, termini of route.	Corporate title of company.	Railway mail service designation.	Railway post-office, route-agent, or mail-route messenger.	Distance.
					Miles.
6074	Ithaca, De Ruyter	} Utica, Ithaca and Elmira {	Canastota and Elmira..	R. A.	118
6075	Horse Heads, Ithaca.				
6080	Canastota, De Ruyter.				
6076	Freeville, Scipio	do	Scipio Centre and Freeville.	R. A.	27
6079	Poughkeepsie, Miller-ton.	Poughkeepsie, Hartford and Boston.	Mount Riza and Poughkeepsie.	R. A.	40
6081	Fonda, Gloversville ..	} Fonda, Johnstown and } Gloversville.	Northville and Fonda..	R. A.	36
6086	Gloversville, Northville.				
6084	Athens, Fair Haven ..	Southern Central	Fair Haven and Sayre.	R. A.	116
6085	Newburgh, Millerton ..	Newburgh, Dutchess and Connecticut.	Millerton and Newburgh.	R. A.	30
6087	Utica, Watertown	} Utica and Black River. {	Ogdensburgh and Utica	R. A.	251
6088	Carthage, Ogdensburgh.				
6089	Cayuga, Ithaca	Cayuga Lake	Cayuga and Ithaca.	R. A.	50
6090	Sodus Point, Gorham Station.	Lake Ontario and Southern ..	Sodus Point and Stanley.	R. A.	34
6091	Buffalo, Jamestown ..	Buffalo and Southwestern ..	Buffalo and Jamestown	R. A.	70
6093	New York, Babylon ..	} South Side	} Patchogue and New York.	R. A.	54
6094	New York, Patchogue ..				
6095	Saratoga Springs, North Creek.	Adirondack	North Creek and Saratoga.	R. A.	57
6097	Rhinecliff, Boston Corners.	Rhinebeck and Connecticut	Boston Corners and Rhinecliff.	R. A.	35
6102	Rochester, Gainsville.	Rochester and State Line ..	Rochester and Salamanca.	R. A.	100
6103	Geneva, Wellsboro' ...	Geneva and Corning and Cowanesque and Antrim.	Geneva and Wellsboro'	R. A.	96
7001	New York, Easton	Central Railroad of New Jersey.	New York, Somerville and Easton.	R. A.	75
7003	Elizabethport, Sea Plain.	do	New York and Squan..	R. A.	50
7004	New York, Philadelphia.	Pennsylvania	New York, Trenton, and Philadelphia.	R. A.	90
	New York, Washington.	Pennsylvania, Philadelphia, Wilmington and Baltimore, and Baltimore and Potomac.	New York and Washington.	R. P. O. ...	33
				R. P. O. ...	30
7005	Camden, Mounmouth Junction.	Pennsylvania, Amboy Division.	New York, Jamesburgh, and Philadelphia.	R. A.	82
7006	Philadelphia, Hightstown.	do	Hightstown and Philadelphia.	R. A.	50
7008	Trenton and intersection Delaware, Lackawanna and Western Railroad.	Pennsylvania, Belvidere Division.	Belvidere and Philadelphia.	R. A.	9
7013	New York, Easton	} Morris and Essex Division of Delaware, Lackawanna and Western. {	} New York, Dover and Easton. New York and Hackettstown.	R. A.	30
7015	Camden, Atlantic City				
		Camden and Atlantic	Philadelphia and Atlantic City.	R. A.	9

operation in the United States on the 30th of June, 1879—Continued.

Annual miles of serv- ice.	Number of round trips with clerks or agents per week.	Number of railway post-office cars or cars in which there are mail apartments.	Dimension of cars or apart- ments.		Day or night service.	Number of round trips per week by express mail over whole route.	Number of round trips per week over portion of route, and between what points.
			Length.	Width.			
73,868	6	1	11 8	6 6	Day		6. Canastota to Ithaca.
		1	18 0	9 0			
		1	14 9	8 10			
		2	15 6	9 0	Reserve		
			10 6	7 0	do		
16,902	6	(*)			Day		
25,040	6	1	9 3	6 10	do		
		1	9 3	6 10	Reserve		
45,072	12	2	8 0	6 0	Day		3. Gloversville to Fonda.
72,616	6	2	11 0	6 3	Day		6. Auburn to Sayre.
		1	11 0	6 3	Reserve		3. Owego to Auburn.
36,934	6	1	8 0	6 4	Day		
		1	9 6	7 0	Reserve		
94,526	6	2	20 0	7 0	Day		6. Utica to Watertown.
		1	20 0	6 6	Reserve		6. Carthage to Ogdensburg; 6, Carthage to Watertown; 12, Theresa Junction to Clayton.
23,788	6	1	10 4	7 0	Day	6	
		1	10 4	7 0	Shop		
21,284	6	1	7 4	6 10	Day		
43,820	6	1	13 6	6 6	do		
		1	13 6	6 6	Reserve		
33,804	6	1	21 6	11 6	Day	12	6. New York to Jamaica.
		1	12 6	6 6		6	6. New York to Garden City.
35,682	6	1	13 5	5 7	Day	6	
21,910	6	1	10 4	7 0	do		
67,608	6	1	12 0	7 0	do		
		1	14 0	7 0			
		1	12 0	7 0	Shop		
60,096	6	1	10 11	6 10	Day		6. Corning to Wellsboro.
		1	10 10	7 1	Reserve		
93,900	12	2	13 0	7 0	Day	18	6. New York to Bound Brook; 6. New York to Plainfield; 27, New York to Elizabeth.
36,308	6	1	12 0	6 9	do	6	6. Elizabethport to Ocean Beach.
56,340	6	1	13 8	6 6	do		
		1	11 0	8 6			
338,720	14	1	46 6	8 6	Day and night		Short line, New York to Phila- delphia.
61,020	6½	1	58 7	8 7	do		
		3	60 0	8 7			27. New York to Philadelphia.
		1	60 0	8 7	Reserve		3. New York to Elizabeth.
		1	45 10	8 7	Shop		3. New York to Rahway; 3, New York to Monmouth Junction; 6. New York to Metuchin.
57,592	6	1	8 0	8 0	Day		9. Philadelphia to Trenton; 9, Philadelphia to South Am- boy.
31,300	6	1	8 8	6 6	do	3	12. Philadelphia to Pemberton.
		1	6 6	6 6			6. Philadelphia to Mount Holly.
56,340	6	1	13 3	6 3	Day	6	3. Philadelphia to Belvidere.
		1	11 3	6 3	Reserve		3. Philadelphia to Trenton; 6, Lambertville to Trenton; 3, Trenton to Summit Junction.
53,210	6	1	11 5	8 10	Day		6. New York to Morristown.
38,812	6	1	12 9	8 11	do		6. New York to Newark.
		1	12 0	9 0			3. New York to Chatham.
		1	12 0	7 0	Reserve		
36,934	6	1	10 2	6 8	Day	6	6. Williamstown to Acta.
		2	9 0	6 4	Reserve		6. Egg Harbor to May's Land- ing.

* For cars see No. 6074.

K.—Railway post-office lines, route-agents, and mail-route messenger service in

Number of route.	Contract designation, terminus of route.	Corporate title of company.	Railway mail service, designation.	Railway post-office, route-agent, or mail-route messenger.	Distance.
					<i>Miles.</i>
7023	Jamesburgh, Sea Girt	Freehold and Jamesburgh	Monmouth Junction and Squan.	R. A.	32
7025	Waterloo, Franklin Furnace.	Sussex.	Franklin Furnace and Waterloo.	R. A.	24
7026	New York, Pemberton Junction.	New Jersey Southern	New York, Whitinga and Philadelphia.	R. A.	89
7028	New York, Denville	{ Delaware, Lackawanna and Western.	Binghamton, Scranton and New York.	R. A.	210
8019	Binghamton, New Hampton.				
7029	Whitinga, Atco	{ New Jersey Southern.	{ Manchester and Bridgeton.	R. A.	73
7031	Atsion, Bridgeton				
7032	Whitinga, Long Beach				
7037	New York, Middletown.	New Jersey Midland	Middletown, Pompton and New York.	R. A.	88
7041	Camden, Cape May	West Jersey	Philadelphia and Bridgeton.	R. A.	37
Br'ch.	Glassborough, Bridgeton.	do	Philadelphia and Cape May.	R. A.	64
8001	{ New York, Pitts-	{ Pennsylvania	{ New York and Pitts-	R. P. O.	444
7004					
8001	Philadelphia, Pitts-	do	Philadelphia and Harrisburgh.	R. A.	109
8002	Philadelphia, Pottsville.	Philadelphia and Reading.	Pottsville and Philadelphia.	R. A.	93
8003	Philadelphia, West Chester.	Philadelphia and West Chester.	Philadelphia and West Chester.	R. A.	27
8004	Philadelphia, Bethlehem.	North Pennsylvania	Bethlehem and Philadelphia.	R. A.	55
8008	Chester, Port Deposit.	Philadelphia and Baltimore Central.	Philadelphia and Port Deposit.	R. A.	57
8010	East Pennsylvania Junction, Waverly.	{ Lehigh Valley	{ Easton and Elmira	R. A.	223
8077	Easton, Allentown.				
8011	Penn Haven Junction, Mount Carmel.	do	Penn Haven Junction and Mount Carmel.	R. A.	40
8013	Pottsville, Herndon.	Philadelphia and Reading.	Pottsville, Tamaqua and Herndon.	R. A.	80
8014	Port Clinton, Williamsport.	do	Williamsport and Port Clinton.	R. A.	121
8015	Sunbury, Tomhicken.	Pennsylvania	Hazleton and Sunbury	R. A.	52
8017	Scranton, Northumberland.	Delaware, Lackawanna and Western.	Scranton and Northumberland.	R. A.	80
8018	Scranton, Carbondale.	Delaware and Hudson Canal Company.	Carbondale and Scranton.	R. A.	37
8020	Elmira, Blossburgh.	Tioga and Elmira State Line	Elmira and Blossburgh	R. A.	45
8022	Sunbury, Erie	Philadelphia and Erie Division, Pennsylvania.	Lock Haven and Erie	R. A.	223
10002	Baltimore, Sunbury.	Northern Central.	Lock Haven and Harrisburgh.	R. A.	115
			Harrisburgh and Baltimore.	R. A.	88
			Williamsport and Baltimore.	R. P. O.	181

operation in the United States on the 30th of June, 1879—Continued.

Annual miles of serv- ice.	Number of round trips with clerks or agents per week.	Number of railway post-office cars or cars in which there are mail apartments.	Dimension of cars or apart- ments.		Day or night service.	Number of round trips per week by express mail over whole route.	Number of round trips per week over portion of route, and between what points.
			Length.	Width.			
			<i>Ft. In.</i>	<i>Ft. In.</i>			
20,032	6	1	9 8	6 4	Day	6	18, Monmouth Junction to Free- hold.
15,024	6	2	6 6	3 6	do		12, Waterloo to Newton.
55,714	6	4	6 6	6 6	Reserve		6, Newton to Midland Junction.
					Day		6, Farmingdale to Eatontown Junction; 3, Bridgeton to Eatontown Junction; 3, New York to Long Branch.
131,460	6	1	20 0	7 6	do	3	3, New York to Scranton.
		1	18 0	7 6	do		6, New York to Boonton.
		1	20 0	7 6	Reserve		
45,698	6	1	7 0	6 3	Day		
		1	7 9	6 4	Reserve		
36,308	12	1	8 0	6 11	Day		
55,088	6	4	14 0	6 8	Day		3, Hawthorne to Bloomingdale.
		1	14 0	6 8	Reserve		
		1	8 0	6 8	do		
23,162	6	1	9 2	8 2	Day	6	
		5	9 2	6 8	Reserve		
40,064	6	1	9 9	6 3	Day		
972,360	21	22	60 0	8 7½	Day and night		9, Philadelphia to Pittsburgh; 3, Harrisburgh to Altoona; 9, Philadelphia to Harris- burgh; 6, Southwest Junction to Pittsburgh; 3, Blairsville to Pittsburgh.
68,234	6	2	15 0	8 8	Day		3, Philadelphia to Columbia.
		1	15 0	8 8	Reserve		3, Lancaster to Harrisburgh.
58,218	6	2	15 2	8 7	Day	6	
		2	15 2	8 7	Reserve		
16,902	6	1	9 0	7 6	Day	12	6, West Chester to Baltimore Central Junction.
34,430	6	1	12 0	8 6	Day	30	24, Philadelphia to Doylestown; 13, Philadelphia to Hartsville.
71,364	12	1	9 6	6 6	do		12, Port Deposit to Chester.
		1	9 4	3 3	do		
139,598	6	4	22 0	8 6	do	6	3, Elmira to Lacyville.
92,648	12	2	10 0	6 0	do		9, Catsasunqua to Easton.
		2	14 0	8 4	do		6, Allentown to Easton.
		2	15 0	6 0	do		6, Easton to East Pennsylvania Junction.
25,040	6	1	24 6	8 0	do		3, Easton to Mauch Chunk.
		1	10 7	6 0	Day		6, Shenandoah to Penn Haven;
50,080	6	1	6 6	6 5	do		6, Mahanoy to Penn Haven.
		1	10 0	7 0	do		6, Pottsville to Shamokin.
		1	9 8	7 0	do		
		1	8 2	6 2	Reserve		
75,746	6	2	9 6	8 7	Day		6, Port Clinton to Tamaqua
		1	15 0	8 6	Reserve		
32,532	6	1	7 4	6 9	Day		
		1	9 0	6 0	do		
		1	8 8	6 0	do		
50,080	6	1	9 3	6 5	Day		12, Nanticoke to Scranton.
		1	11 2	8 8	Shop		
46,324	12	1	8 10	6 6	Day	6	
		1	8 10	6 6	Reserve		
28,170	6	1	14 3	7 0	Day	6	
		1	10 2	6 3	do		
139,598	6	5	10 0	8 0	Day		6, Erie to Warren.
71,990	6	3	15 0	8 4	Night	6	6, Williamsport to Lock Haven.
55,098	6	2	14 9	8 7	do		6, Williamsport to Harrisburgh.
		1	10 0	7 4	Reserve		12, Harrisburgh to Baltimore;
113,306	6	2	45 0	8 4	Day and night		6, York to Baltimore.
		2	40 0	8 4	Reserve		

K.—*Railway post-office lines, route-agents, and mail-route messenger service in*

Number of route.	Contract designation, terminus of route.	Corporate title of company.	Railway mail service, designation.	Railway post-office, route-agent, or mail-route messenger.	Distance.
					<i>Miles.</i>
8024	Alton, Carrollton	New York, Lake Erie and Western.	Carrollton and Buttsville.	R. A.	25
8025	Irvine, Oil City	Pittsburgh, Titusville and Buffalo.	Irvine and Oil City ...	R. A.	50
8080	Harrisburgh, Martinsburgh.	Cumberland Valley	Corry and Oil City ...	R. A.	45
			Harrisburgh and Martinsburgh.	R. A.	94
8031	Columbia, Sinking Springs.	Philadelphia and Reading...	Reading and Columbia.	R. A.	46
8033	Columbia, Frederick.	Frederick Division Pennsylv.	Columbia and Frederick	R. A.	69
8034	Hanover Junction, Gettysburgh.	Hanover and Gettysburgh ..	Hanover Junction and Gettysburgh.	R. A.	30
8035	Huntingdon, Mount Dallas Station.	Huntingdon and Broad Top.	Huntingdon and Cumberland.	R. A.	76
8074	Mount Dallas Station, New Bridgeport.				
8036	Tyrone, Curwinsville.	Tyrone and Clearfield Branch Pennsylvania.	Clearfield and Tyrone..	R. A.	41
8039	Tyrone, Lock Haven.	Bald Eagle Branch Pennsylvania.	Lock Haven and Tyrone.	R. A.	55
8040	Blairsville, Allegheny.	West Pennsylvania Division Pennsylvania.	Blairsville and Pittsburgh.	R. A.	65
8041	Washington, Wheeling.	Wheeling, Pittsburgh and Baltimore.	Washington and Wheeling.	R. A.	32
8042	Pittsburgh, Oil City ..	Allegheny Valley	Oil City and Pittsburgh	R. A.	132
8044	Meadville, Oil City ...	Atlantic and Great Western, Erie and Pittsburgh	Meadville and Oil City.	R. A.	72
8045	Miles Grove, New Castle.		Erie and Pittsburgh ...	R. A.	146
8029	New Castle, Homewood.	Pittsburgh, Fort Wayne and Chicago.			
8052	Greenville, Hilliards.	Shenango and Allegheny...	Greenville and Hilliards.	R. A.	47
8054	Freeport, Butler	West Pennsylvania Division Pennsylvania.	Butler and Freeport ...	M. R. M.	21
8055	Wilmington, Reading.	Wilmington and Northern ..	Reading and Wilmington.	M. R. M.	72
8056	Pittsburgh, Washington.	Chartiers Division Pennsylvania Central and St. Louis.	Pittsburgh and Washington.	M. R. M.	31
8057	Perkioman Junction, Emaus.	Philadelphia and Reading ..	Allentown and Pawling.	M. R. M.	44
8060	Lebanon, Tower City	do	Tower City and Lebanon.	M. R. M.	44
8061	Towanda, Bernice	State Line and Sullivan ..	Towanda and Bernice..	M. R. M.	29
8063	Cumberland, Pittsburgh.	Pittsburgh Division Baltimore and Ohio.	Cumberland and Pittsburgh.	R. A.	148
8064	Carbondale, Susquehanna Depot.	New York, Lake Erie and Western.	Nineveh and Carbondale.	M. R. M.	60
8031	Nineveh Junction, Jefferson Junction.	Delaware and Hudson Canal Company.			
8065	Lawrenceville, Elkland.	Corning, Cowanesque and Antrim.	Lawrenceville and Elkland.	M. R. M.	15
8067	Lewisburgh, Spring Mills.	Lewisburgh, C. and Spruce Creek Branch Pennsylvania.	Lewisburgh and Laurelton.	M. R. M.	43
8071	Marion Junction, Richmond Furnace.	Southern Pennsylvania Branch Cumberland Valley.	Chambersburgh and Richmond Furnace.	M. R. M.	25
8075	Allentown, Harrisburgh.	East Pennsylvania and Lebanon Valley Branch Philadelphia and Reading.	Allentown and Harrisburgh.	R. A.	90
8078	Red Bank Furnace, Driftwood.	Low Grade Division Allegheny Valley.	Driftwood and Red Bank Furnace.	R. A.	110
8080	Tunkhannock, Montrose.	Montrose	Montrose and Tunkhannock.	M. R. M.	26
8081	Pittsburgh, Monongahela City.	Pittsburgh, Virginia and Charleston Division Pennsylvania.	Pittsburgh and Monongahela City.	M. R. M.	31
8086	Pollock, Butler	Parker and Karns City	Pollock and Butler ...	M. R. M.	35

operation in the United States on the 30th of June, 1879—Continued.

Annual miles of service.	Number of round trips with clerks or agents per week.	Number of railway post-office cars or cars in which there are mail apartments.	Dimension of cars or apartments.		Day or night service.	Number of round trips per week by express mail over whole route.	Number of round trips per week over portion of route, and between what points.
			Length.	Width.			
			<i>Ft. In.</i>	<i>Ft. In.</i>			
15, 650	6	1	16 0	8 0	Day.....		6, Carrollton to Custer City.
31, 300	6	2	12 0	6 0	do.....		6, Carrollton to Bradford.
28, 170	6	3	12 0	6 0	Reserve.....		12, Oil City to Corry.
58, 844	6	1	14 0	8 4	Day.....		3, Irvine to Oil City.
		1	8 4	8 2	Reserve.....		6, Harrisburgh to Greencastle.
28, 796	6	1	6 5	6 0	Day.....	12	6, Harrisburgh to Chambersburgh.
		1	7 4	6 5	do.....		
43, 194	6	1	11 0	8 0	Day.....		3, Lancaster to Hanover.
37, 560	12	2	11 10	6 0	Day.....	3	6, Berlin Junction to Hanover.
47, 576	6	1	7 10	6 5	do.....		6, Huntingdon to Bedford.
		2	8 10	6 8	Reserve.....		
25, 666	6	1	10 9	8 1	Day.....		6, Osceola Mills to Tyrone.
34, 430	6	1	11 0	8 2	do.....		6, Lock Haven to Bellefonte.
40, 660	6	1	11 4	8 8	do.....		
		1	11 4	8 8	Reserve.....		
20, 032	6	1	9 2	8 2	Day.....	6	
82, 632	6	1	16 0	8 4	do.....	12	
		1	15 0	8 4	do.....		
48, 072	6	1	18 0	6 6	Day.....	6	
92, 648	6	2	12 9	9 9	do.....	6	
		2	12 0	9 0	Reserve.....		
29, 422	6	1	13 0	7 0	Day.....		6, Greenville to Mercer.
		1	11 3	6 10	do.....		
26, 292	12	1	5 3	8 7	do.....		
45, 072	6	1	7 8	6 10	do.....		
		1	7 6	6 10	do.....		
		1	7 6	6 10	Shop.....		
38, 812	12	1	14 0	6 0	do.....	6	
27, 544	6	1	10 6	3 7	Day.....		6, Collegeville to Perkiomam Junction.
		1	11 2	3 10	Reserve.....		
		1	7 8	3 8	do.....		
27, 544	6	2	6 6	6 6	Day.....		6, Lebanon to Tremont.
							3, Pine Grove to Tremont.
18, 154	6	1	6 0	8 0	do.....		
92, 648	6	3	9 0	8 1	do.....	6	
37, 560	6	1	6 9	6 2	do.....		6, Susquehanna to Jefferson Junction.
		1	9 0	6 6	Reserve.....		
9, 390	6	1	5 11	7 5	Day.....		
26, 918	6	1	9	8 6	do.....		6, Montandon to Mifflinburg.
15, 650	6	1	7 7	8 1	do.....		6, Chambersburgh to South Pennsylvania Junction.
56, 340	6	1	11 7	8 6	do.....		
		1	15 10	8 6	do.....		
		1	10 8	8 6	Shop.....		
68, 900	6	1	14 0	8 6	Day.....		6, Red Bank Furnace to Bay-noldsville.
		1	14 3	8 8	do.....		
		1	14 8	8 5	Shop.....		
17, 528	6	1	4 9	6 5	Day.....		
19, 406	6	1	10 4	8 9	do.....	6	
		1	11 0	8 7	do.....		
		1	10 4	8 9	Reserve.....		
21, 910	6	1	9 0	4 6	Day.....		6, Parker Junction to Millers-town.
		1	8 0	5 1	do.....		

K.—Railway post-office lines, route-agents, and mail-route messenger service in

Number of route.	Contract designation, terminal of route.	Corporate title of company.	Railway mail service, designation.	Railway post-office route-agent, or mail-route messenger.	Distance. Miles.
8091	Reading, Slatington	Berks and Lehigh Branch Philadelphia and Reading.	Slatington and Reading.	M. R. M.	43
8093	Larabee, Clermont	McKean and Buffalo	Larabee and Clermont	M. R. M.	23
8094	York, Delta	Peach Bottom	York and Delta	M. R. M.	35
8098	New Castle, Stoneboro	New Castle and Franklin	Stoneboro and New Castle.	M. R. M.	36
8105	Clarion, Foxburgh	Foxburgh, St. Petersburg and Clarion.	Clarion and Foxburg	M. R. M.	31
8107	Southwest Junction, Uniontown.	Southwest Pennsylvania	Greensburg and Oliphant Furnace.	R. A.	40
8108	Lewistown Junction, Salins Grove Junction.	Lewistown Division of Pennsylvania.	Sunbury and Lewistown	R. A.	54
9501	Wilmington, Delmar	Delaware Division, Philadelphia, Wilmington and Baltimore, and Eastern Shore.	Philadelphia and Crisfield.	R. A.	135
9502	Delmar, Crisfield				
9503	Clayton, Easton		Clayton and Easton	R. A.	44
9504	Harrington, Lewes		Harrington and Lewes	R. A.	40
9505	Wilmington, Pomeroy	Delaware Western	Wilmington and Pomeroy.	R. A.	38
9506	Georgetown, Selbyville	Breakwater, Frankfort and Worcester.	Georgetown and Franklin City.	R. A.	56
10016	Selbyville, Franklin City				
10001	Baltimore, Philadelphia.	Philadelphia, Wilmington and Baltimore.	Philadelphia and Baltimore.	R. A.	98
10008	Cambridge, Seaford	Dorchester and Delaware	Seaford and Cambridge.	R. A.	33
10009	Salisbury, Ocean City	Wicomico and Pocomoke	Ocean City and Salisbury.	R. A.	30
10010	Townsend, Centreville	Queen Ann and Kent	Townsend and Centreville.	R. A.	36
10012	Clayton, Chestertown.	Kent County	Clayton and Chestertown.	R. A.	34
10003	Baltimore, Wheeling	Baltimore and Ohio	Baltimore and Grafton.	R. P. O.	294
10005	Weverton, Hagerstown.	Washington County Branch Baltimore and Ohio.	Grafton and Wheeling, Hagerstown and Weverton.	R. A.	99
10006	Baltimore, Williamsport.	Western Maryland	Baltimore and Williamsport.	R. A.	93
10007	Annapolis, Annapolis Junction.	Annapolis and Elk Ridge	Annapolis and Annapolis Junction.	R. A.	21
10011	Cumberland, Piedmont	Cumberland and Piedmont	Cumberland and Piedmont.	R. A.	33
10013	Bay View, Washington	Baltimore and Potomac	Baltimore and Washington.	R. A.	46
10014	Bowie, Pope's Creek	Bowie and Pope's Creek Division, Baltimore and Potomac.	Bowie and Pope's Creek.	R. A.	46
10017	St. Denis, Point of Rocks.	Baltimore and Ohio	Baltimore and Harper's Ferry.	R. A.	81
10018	Lake Roland, Western Maryland Railroad Junction.	Western Maryland	Lake Roland and Western Maryland Railroad Junction.	R. C. A.	84
11001	Washington, Richmond	Richmond, Fredericksburg and Potomac.	Washington and Petersburg.	R. P. O.	116
11008	Richmond, Petersburg	Richmond and Petersburg	do	R. P. O.	24
11002	Washington, Danville.	Washington City, Virginia Midland and Great Southern.	Washington and Danville.	R. P. O.	243
	Branch, Owl Run, Warrenton.	do	Warrenton and Warrenton Junction.	M. R. M.	9
11003	Manassas, Strasburgh.	Manassas Division Virginia Midland and Great Southern	Alexandria and Strasburgh.	R. A.	90
11004	Alexandria, Round Hill	Washington and Ohio	Alexandria and Round Hill.	R. A.	52

operation in the United States on the 30th of June, 1879—Continued.

Annual miles of service.	Number of round trips with clerks or agents per week.	Number of railway post-office cars or cars in which there are mail apartments.	Dimension of cars or apartments.		Day or night service.	Number of round trips per week by express mail over whole route.	Number of round trips per week over portion of route, and between what points.
			Length.	Width.			
			<i>Ft. In.</i>	<i>Ft. In.</i>			
26,918	6	1	8 0	6 8	Day		
14,398	6	1	8 7	6 8	do		
21,910	6	1	8 10	7 0	do		
		1	13 8	7 4	Reserve		
22,536	6	1	8 8	5 3	Day		6, New Wilmington to New Castle.
19,406	6	2	8 4	7 0	do		6, Elenaburgh to Clarion; 6, Foxburgh to Elenaburgh; 6, Foxburgh to St. Petersburg.
25,040	6	1	7 9	8 4	do	6	
33,804	6	1	6 6	6 6	do		9, Selins Grove to Selins Grove Junction.
84,510	6	1	18 6	6 8	do		6, Philadelphia to Wyoming.
		1	25 0	8 0			9, Philadelphia to Wilmington.
		1	22 6	8 4			3, Wilmington to New Castle.
		1	22 6	7 10	Reserve		
27,544	6	1	10 0	6 0	Day		
25,040	6	1	7 0	7 0	do		6, Georgetown to Harrington.
23,788	6	2	6 6	6 10	do		
35,056	6	1	6 0	6 6	do	3	
61,348	6	2	24 0	8 6	do		12, Philadelphia to Wilmington; 8, Philadelphia to Lamokin.
20,658	6	1	11 8	8 7	do		
18,780	6	1	9 1	8 7	do	3	
22,536	6	1	20 0	6 4	do		
21,284	6	1	8 3	6 8	do		
429,240	14	8	51 0	8 9	Day and night.	7	6, Washington to Harper's Ferry.
61,974	6	2	17 0	8 7	do	7	18, Washington to Baltimore.
30,048	12	2	8 6	8 0	Day		
58,218	6	2	11 0	8 2	do		6, Baltimore to Hagerstown.
13,146	6	1	9 4	8 5	do		
20,658	6	1	10 8	6 8	do		
20,658	6	4	14 6	8 6	do		26, Baltimore to Washington; 12, Washington to Baltimore.
30,048	6	1	9 4	8 5	do		
50,706	6	2	14 0	8 4	Day		6, St. Denis to Araby.
169,360	14	3	50 0		Day and night.		
35,040	14	2	50 0		do		
354,780	14	5	42 0	9 6	do		
11,268	12				do		
56,340	6	2	10 0	8 6	do		
32,562	6	1	11 0	6 2	do		6, Alexandria to Leesburgh.

K.—*Railway post-office lines, route-agents, and mail-route messenger service in*

Number of route.	Contract designation, termini of route.	Corporate title of company.	Railway mail service, designation.	Railway post-office, route-agent, or mail-route messenger.	Distance.
					Miles.
11005	Richmond, Huntington	Chesapeake and Ohio.....	Richmond and Covington.	R. A.....	205
			Covington and Huntington.	R. A.....	216
11006	Richmond, Danville..	Richmond and Danville.....	Richmond and Danville.	R. A.....	140
11007	Richmond, West Point	Richmond, York River and Chesapeake.	West Point and Richmond.	R. A.....	38
11009	Petersburgh, Weldon	Petersburgh.....	Petersburgh and Weldon.	R. P. O..	66
11011	Petersburgh, Norfolk	Norfolk and Petersburgh Division, Atlantic, Mississippi and Ohio.	Norfolk and Lynchburgh.	R. A.....	205
11012	Petersburgh, Lynchburgh.	South Side Division, Atlantic, Mississippi and Ohio.			
11013	Lynchburgh, Bristol..	Virginia and Tennessee Division, Atlantic, Mississippi and Ohio.	Lynchburgh and Bristol.	R. P. O..	204
11015	Portsmouth, Weldon	Seaboard and Roanoke.....	Norfolk and Raleigh.....	R. A.....	176
12001	Raleigh, Weldon.....	Raleigh and Gaston.....			
11102	Fredericksburgh, Orange Court-House.	Royal Land Company.....	Fredericksburgh and Orange Court-House.	R. A.....	38
12001	Harper's Ferry, Staunton.	Valley Branch Baltimore and Ohio Railroad.	Harper's Ferry and Staunton.	R. A.....	126
13002	Weldon, Wilmington..	Wilmington and Weldon....	Weldon and Wilmington.	R. A.....	163
13003	Wilmington, Charlotte	Carolina Central.....	Wilmington and Charlotte.	R. A.....	196
13004	Goldsboro', Greensboro', Danville, Greensboro', Greensboro', Charlotte.	Richmond and Danville..	Goldsboro' and Greensboro'.	R. A.....	136
			Danville and Charlotte.	R. A.....	141
13005	Goldsboro', Morehead City.	Atlantic and North Carolina	Goldsboro' and Beaufort.	R. A.....	94
13006	Salisbury, Henry's....	Western North Carolina....	Salisbury and Henry's	R. A.....	117
13007	Charlotte, Augusta...	Charlotte, Columbia and Augusta.	Charlotte and Augusta.	R. A.....	196
13008	Charlotte, Shelby.....	Carolina Central.....	Charlotte and Shelby..	R. A.....	55
13009	Charlotte, Statesville..	Atlantic, Tennessee and Ohio.	Statesville and Charlotte.	M. R. M..	49
13010	Raleigh, Hamlet.....	Raleigh and Augusta Air-Line.	Raleigh and Hamlet....	R. A.....	97
13011	Fayetteville, Gulf....	Western.....	Egypt Depot and Fayetteville.	R. A.....	45
13012	Greensboro', Salem...	Northwestern North Carolina.	Greensboro' and Salem.	M. R. M..	29
14001	Columbia, Greenville..	Greenville and Columbia....	Greenville and Columbia.	R. A.....	144
14002	Columbia, Wilmington	Wilmington, Columbia and Augusta.	Wilmington and Columbia.	R. A.....	132
14003	Kingsville, Augusta... Kingsville, Columbia.. Branchville, Charleston.	South Carolina.....	Columbia and Charleston.	R. A.....	203
			Charleston and Augusta.		
14004	Charleston, Savannah..	Savannah and Charleston....	Charleston and Savannah.	R. A.....	115
14005	Charleston, Florence..	Northeastern.....	Florence and Charleston.	R. A.....	163
14006	Florence, Cheraw.....	Cheraw and Darlington.....	Cheraw and Florence...	R. A.....	41
14007	Chester, Dallas.....	Chester and Lenoir Narrow-Gauge.	Dallas and Chester.....	R. A.....	51
14008	Alston, Spartanburgh..	Spartanburgh, Union and Columbia.	Lynn and Alston.....	R. A.....	111
14011	Spartanburgh C. H., Coleman.	Spartanburgh and Asheville.			

operation in the United States on the 30th of June, 1879—Continued.

Annual miles of serv- ice.	Number of round trips with clerks or agents per week.	Number of railway post-office cars or cars in which there are mail apartments.	Dimension of cars or apart- ments.		Day or night service.	Number of round trips per week by express mail over whole route.	Number of round trips per week over portion of route and between what points.
			Length.	Width.			
			<i>Ft. In.</i>	<i>Ft. In.</i>			
128,330	6	7	18 0	8 0	Day	7	
157,680	7				do	6	
102,200	7	6	25 0	8 9	do	6	
23,788	6	1	10 6	6 9	do		
96,360	14	2	50 0		do		
128,330	6	4	21 0	9 0	do		
148,920	7	4	41 0	8 7	do		
110,176	6	5	10 0	8 0	do		
23,788	6	1	15 7	6 0	do		
78,876	6	2	14 10	8 7	do		
118,990	7	1	23 0	9 0	do	6	
		1	28 0	8 0	do		
		1	22 0	8 9	do		
122,696	6	2	15 0	8 9	Night		
		1	14 0	8 6	do		
		1	14 0	7 10	do		
94,900	7	2	15 0	8 0	Day		6, Raleigh and Goldsboro'.
		1	14 0	7 10			
102,930	7	2	25 0	9 0	Day and night.	7	
		1	25 0	8 6			
		1	25 0	8 11			
58,844	6	2	9 10	6 8	Day and night.		
85,410	7	2	12 6	8 4	Night		
143,080	7	1	19 9	8 6	Day and night		
		1	25 4	9 0			
		1	18 8	8 0	Reserve		
34,430	6	1	9 0	6 7	Day		
30,674	6	1	9 4	7 8	Day and night.		
60,722	6	1	14 0	6 0	do		
28,170	6	1	10 7	6 0	Day		
18,154	6	1	14 0	8 6	do		
90,144	6	1	12 4	8 2	do		
		1	14 0	8 2			
		1	11 10	9 0			
140,160	7	3	22 7	8 9	Night		7, Wilmington and Florence.
127,078	6	1	10 5	8 3	Day		13, Branchville to Charleston;
		1	9 9	8 0		7	7, Branchville to Augusta; 6,
		1	9 11	8 0	Day		Branchville to Columbia.
63,950	7	1	21 0	9 0	Day		
		1	17 0	8 11			
75,190	7	2	11 1	8 3	Day	7	
		1	10 1	8 5			
		1	11 3	8 4			
25,666	6	1	13 3	8 5	Day		
81,926	6	1	9 6	6 10	do		
60,486	6	1	7 1	6 6	do		
		1	7 4	6 2			

K.—*Railway post-office lines, route-agents, and mail-route messenger service in*

Number of route.	Contract designation, terminal of route.	Corporate title of company.	Railway mail service, designation.	Railway post-office, route-agent, or mail-route messenger.	Distance.
					<i>Miles.</i>
14009	Anderson C. H., Walhalla.	Greenville and Columbia ..	Belton and Walhalla ..	M. R. M.	45
	Branch, Belton, Anderson C. H.				
14010	Port Royal, Augusta ..	Port Royal and Augusta ..	Augusta and Port Royal ..	R. A.	112
15001	Atlanta, Charlotte	Atlanta and Charlotte Air-Line.	Charlotte and Atlanta ..	R. A.	286
15002	Atlanta, Chattanooga ..	Western and Atlantic	Chattanooga and Atlanta.	R. P. O.	138
15003	Atlanta, West Point ..	Atlanta and West Point	Atlanta and Montgomery.	R. A.	87
15004	Augusta, Atlanta	Georgia	Augusta and Atlanta ..	R. P. O.	172
15005	Millen, Augusta	Central Railroad and Banking Company.	Augusta and Macon	R. A.	52
15007	Union Point, Athens ..	Georgia	Athens and Union Point	M. R. M.	40
15009	Savannah, Live Oak				
	Dupont, Thomasville, branch.	Atlantic and Gulf	Dupont and Albany	R. A.	130
15018	Thomasville, Albany ..				
15010	Savannah, Macon	Central Railroad and Banking Company.	Augusta and Macon ..	R. A.	192
15011	Macon, Columbus	Southwestern	Savannah and Millen } Macon and Columbus. }	R. A.	101
15012	Macon, Atlanta	Central Railroad and Banking Company.	Atlanta and Macon	R. A.	104
15013	Macon, Brunswick	Macon and Brunswick	Macon and Brunswick ..	R. A.	188
15016	Macon, Eufaula	Southwestern	Macon and Clayton	R. A.	145
15021	Camak, Macon	Macon and Augusta	Camak and Macon	M. R. M.	81
15022	Griffin, Carrollton				
		Savannah, Griffin and North Alabama.	Griffin and Carrollton ..	R. A.	60
15023	Brunswick, Albany	Brunswick and Albany	Brunswick and Albany ..	R. A.	173
16001	Fernandina, Cedar Keys.	Atlantic, Gulf, and West India Transit.	Fernandina and Cedar Keys.	R. A.	134
16002	Lake City, Chattahoochee.	Jacksonville, Pensacola and Mobile.	Jacksonville and Chattahoochee.	M. R. M.	167
16003	Pensacola, Whiting Junction.	Pensacola	Whiting Junction and Pensacola.	M. R. M.	44
10006	Jacksonville, Lake City.	Florida Central	Jacksonville and Chattahoochee.	M. R. M.	30
17001	Montgomery, West Point.	Western, of Alabama	Atlanta and Montgomery.	R. A.	4
17002	Montgomery, Selma ..				
17003	Montgomery, Eufaula.	Montgomery and Eufaula ..	Eufaula and Montgomery	M. R. M.	51
17004	Montgomery, Decatur ..	South and North Alabama ..	Decatur and Montgomery.	R. A.	120
17006	Marion Junction, Greensborough.	Selma, Marion and Memphis	Marion Junction and Greensborough.	M. R. M.	57
17007	Opelika, Columbus	Western, of Alabama	Columbus and Opelika ..	R. A.	2
17008	Columbus, Troy	Mobile and Girard	Columbus and Troy	R. A.	28
17009	Selma, Meridian	Alabama Central	Selma and Meridian	R. A.	11
17010	Selma, Dalton	Selma, Rome and Dalton ...	Dalton and Selma	R. A.	57
17012	Mobile, Montgomery ..	Mobile and Montgomery ...	Montgomery and Mobile ..	R. A.	170
17013	Mobile, New Orleans ..	New Orleans and Mobile ...	Mobile and New Orleans ..	R. A.	140

operation in the United States on the 30th of June, 1879—Continued.

Annual miles of service.	Number of round trips with clerks or agents per week.	Number of railway post-offices cars or cars in which there are mail apartments.	Dimension of cars or apartments.		Day or night service.	Number of round trips per week by express mail over whole route.	Number of round trips per week over portion of route, and between what points.
			Length.	Width.			
			<i>Ft. In.</i>	<i>Ft. In.</i>			
28, 170	6	1	11 3	8 1	Day		
81, 760	7	2	10 6	6 10	Night		
194, 180	7	2	25 0	9 0	Day and night	7	
		1	25 0	8 10	Reserve		
		1	25 0	9 0	Day		
201, 480	14	2	39 4	8 7	Day and night		
		2	25 0	8 5	Reserve		
		1	35 6	7 10	Day		
63, 510	7	1	26 0	8 9	Day		
125, 560	7	2	25 0	8 8	do	7	
		1	21 0	8 8	Day		
33, 178	6	1	9 3	6 8	Day	7	
25, 040	6	1	10 8	6 4	Day		
130, 670	7	3	16 10	9 2	Day and night		
94, 900	7	2	12 9	8 4	Night and day		
120, 192	6	2	9 2	7 0	Day	7	
		1	9 2	7 0	Reserve		
73, 730	7	1	10 6	8 4	Day		
		1	11 0	8 7	Day		
65, 104	6	2	22 0	8 4	Day	8	
137, 240	7	2	15 0	9 3	Day and night		6, Macon to Jessup.
		2	19 8	8 10	Day		
		1	21 8	8 10	Day		
105, 850	7	1	14 8	8 8	Day		
		1	11 0	6 8	Day		
		1	11 9	6 3	Day		
50, 706	6	2	10 8	6 3	Day		
37, 560	6	1	9 0	6 6	do		
54, 149	3	1	9 10	5 10	do		
66, 404	6	1	11 0	5 4	do		
		1	10 0	5 3	Reserve		
		1	10 6	5 6	Day and night		
107, 310	7	1	12 0	7 0	Day		
		1	10 6	7 0	Reserve		
		1	10 0	6 0	do		
		1	10 6	5 6	Day		
32, 120	7	1	8 1	7 4	Night		
43, 070	7	1	11 0	5 4	Day		7, Jacksonville to Baldwin.
		1	10 0	5 3	Reserve		
		1	10 6	5 6	Day		
64, 240	7	1	23 3	8 9	Day		
36, 500	7	2	10 10	7 10	do		
		1	12 0	8 0	Day		
59, 130	7	2	11 0	8 9	Day		6, Montgomery to Union Springs.
133, 590	7	5	14 6	9 5	do	7	
23, 162	6	1	8 5	6 6	do		
35, 056	12	2	12 5	7 0	do		
56, 340	6	1	11 7	6 5	Day and night		
		1	12 9	6 10	Day		
82, 490	7	2	12 0	7 0	Day and night		
		1	12 0	7 0	Reserve		
173, 010	7	3	12 0	7 6	Day		
		3	16 6	7 6	Reserve		
130, 670	7	2	25 0	8 7	Night		
		3	13 3	8 10	Reserve		
204, 400	14	4	17 0	7 6	Day and night		

K.—Railway post-office lines, route-agents, and mail-route messenger service in

Number of route.	Contract designation, termini of route.	Corporate title of company.	Railway mail service, designation.	Railway post-office, route-agent, or mail-route messenger.	Distance.
					<i>Miles.</i>
17015	Chattanooga, Meridian	Alabama and Great Southern	Chattanooga and Meridian.	R. A . . .	295
17016	Opelika, Goodwater . . .	Savannah and Memphis	Goodwater and Opelika .	R. A . . .	69
17017	Selma, Pine Apple . . .	Selma and Gulf	Selma and Pine Apple .	M. R. M. .	43
17021	Eufaula, Clayton	Vicksburgh and Brunswick.	Macon and Clayton . . .	R. A . . .	22
18001	Canton, Cairo	Chicago, Saint Louis and New Orleans.	Cairo and New Orleans.	R. P. O. .	344
18002	Memphis, Grenada . . .	Mississippi and Tennessee .	Memphis and Grenada .	R. A . . .	101
18003	Vicksburgh, Meridian.	Vicksburgh and Meridian . .	Meridian and Vicksburgh.	R. A . . .	140
18004	Mobile, Columbus	Mobile and Ohio	Columbus and Corinth } Corinth and Meridian } Meridian and Mobile . }	R. A . . .	{ 143 183 131 }
17005	Memphis, Stevenson . .	Memphis and Charleston . .	Chattanooga and } Memphis . }	R. A . . .	{ 272 39 }
19004	Nashville, Chattanooga (part)	Nashville, Chattanooga and Saint Louis.	Chattanooga and } Memphis . }	R. A . . .	{ 272 39 }
19001	Nashville, Lebanon . . .	Tennessee and Pacific	Lebanon and Nashville .	M. R. M. .	32
19004	Nashville, Chattanooga	Nashville, Chattanooga and Saint Louis.	Nashville and Chattanooga.	R. A . . .	153
19002	Bristol, Chattanooga . .	East Tennessee, Virginia and Georgia.	Bristol and Chattanooga	R. P. O. .	243
19005	Fayetteville, Decherd	Memphis and Charleston . .	Decherd and Fayetteville.	M. R. M. .	40
19006	Nashville, Decatur	Louisville, Nashville and Great Southern.	Bowling Green and } Decatur . }	R. A . . .	{ 122 73 }
20005	Bowling Green, Nashville.	Louisville, Nashville and Great Southern.	Bowling Green and } Decatur . }	R. A . . .	{ 122 73 }
19007	Nashville, Hickman . . .	Nashville, Chattanooga and Saint Louis.	Nashville and Hickman	R. A . . .	171
19008	Guthrie, Nashville	Saint Louis and Southern.	Evansville and Nash- } ville . }	R. A . . .	{ 48 111 }
20010	Evansville, Guthrie . . .	Saint Louis and Southern.	Evansville and Nash- } ville . }	R. A . . .	{ 48 111 }
19009	Guthrie, Paris	Louisville, Nashville and } Great Southern. }	Louisville and Mem- } phis . }	R. P. O. .	{ 82 44 51 }
19010	Paris, Milan (part) . . .	Louisville, Nashville and } Great Southern. }	Louisville and Mem- } phis . }	R. P. O. .	{ 82 44 51 }
20008	Bowling Green, Guthrie.	Louisville, Nashville and } Great Southern. }	Louisville and Mem- } phis . }	R. P. O. .	{ 82 44 51 }
19012	Morristown, Wolf Creek.	East Tennessee, Virginia and Georgia.	Morristown and Wolf Creek	M. R. M. .	40
19014	Memphis, Covington . .	Paducah and Memphis	Covington and Memphis	M. R. M. .	30
19011	Knoxville, Careyville . .	Knoxville and Ohio	Careyville and Knoxville.	M. R. M. .	39
19016	Tullahoma, McMinnville.	Nashville, Chattanooga and Saint Louis.	McMinnville and Tullahoma.	M. R. M. .	25
20002	Covington, Lexington	Kentucky Central	Mayaville and Lexington.	R. A . . .	{ 19 50 }
20016	Mayaville, Paris	Kentucky Central	Mayaville and Lexington.	R. A . . .	{ 19 50 }
20003	LaGrange, Lexington	Louisville, Cincinnati and Lexington.	Louisville and Lexington.	R. A . . .	{ 66 28 }
20004	Cincinnati, Louisville (part).	Louisville, Cincinnati and Lexington.	Louisville and Lexington.	R. A . . .	{ 66 28 }
20005	Louisville, Nashville . .	Louisville, Nashville and } Great Southern. }	Louisville and Fish Point.	R. A . . .	30
20007	Fish Point.	Louisville, Nashville and } Great Southern. }	Louisville and Fish Point.	R. A . . .	30
20009	Branch, Richmond Junction, Richmond.	Louisville, Nashville and } Great Southern. }	Richmond and Stanford.	M. R. M. .	{ 110 39 }
20009	Paducah, Trimble	Paducah and Memphis	Paducah and Trimble .	R. A . . .	76
20005	Louisville, Nashville . .	Louisville, Nashville and Great Southern.	Louisville and Nashville	R. P. O. .	157
20002	Covington, Lexington	Kentucky Central	Cincinnati and Lexington.	R. A . . .	39
20004	Cincinnati, Louisville .	Louisville, Cincinnati and Lexington.	Cincinnati and Louisville.	R. P. O. .	110
20018	Cincinnati Junction, Louisville and Nashville Junction.	.....	..... do	R. A . . .	110
			..... do	R. P. O. .	4

operation in the United States on the 30th of June, 1879—Continued.

Annual miles of service.	Number of round trips with clerks or agents per week.	Number of railway post-office cars or cars in which there are mail apartments.	Dimension of cars or apartments.		Day or night service.	Number of round trips per week by express mail over whole route.	Number of round trips per week over portion of route, and between what points.
			Length.	Width.			
215,350	7	1	<i>Ft. In.</i> 10 0	<i>Ft. In.</i> 8 0	Day		
		1	14 6	6 6	.....	
		1	15 7	7 4	.....	
		1	12 6	7 3	.....	
		1	11 6	8 8	.....	
		1	14 6	8 8	Reserve		
37,560	6	2	6 6	6 0	Day		
17,888	4	1	6 9	5 6	do		
		1	12 4	7 3	Reserve		
16,060	7	1	14 8	8 8	Day		
		1	11 0	6 8	.....	
		1	11 9	6 3	.....	
251,120	7	4	43 6	8 9	Day and night		
		1	48 0	9 0	.....	
		1	43 6	8 9	Reserve		
73,730	7	2	12 6	6 10	Day		
		1	12 6	6 10	Reserve		
102,200	7	1	9 0	6 11	Night		
		1	8 7	8 0	.....	
		1	8 0	7 3	.....	
104,390	7	3	21 0	9 0	Day and night		
140,890	7	2	21 6	7 6	do		
98,550	7	1	21 6	7 6	Reserve		
198,560	7	2	24 0	9 0	Day		
28,470							
20,032	6	1	8 0	7 0	Day	6	
111,690	7	2	20 0	8 0	do	7	
177,390	7	3	38 6	9 0	do		
25,040	6	1	8 0	6 0	do		
89,060	7	3	14 9	9 0	do	7	
53,290	7				do		
107,046	6	3	12 0	8 6	do	6	
30,048	6	3	11 6	7 6	do	6	
69,486	6						
59,860	7						
32,120	7	3	45 0	9 0	Night	7	
37,230	7						
25,040	6	1	9 10	6 7	Day		
23,788	6	1	8 0	6 6	do		
24,414	6	1	5 0	4 4	do		
21,910	6				do		
11,894	6	2	12 0	6 0	do	6	
31,300							
41,316	6	3	8 9	6 1	Day	6	
17,528							
18,780	6	2	14 0	7 4	Day		
93,274							
	6	1	14 0	7 4	Day		
47,576	6	1	9 0	6 4	do		
136,510	7	2	45 0	9 0	do		
61,974	6	3	6 0	12 0	do	6	
160,600	14	2	45 0	9 0	Day and night		
149,160	13	2	10 0	7 3	Day		
5,840	14	2	45 0	9 0	Day and night		
		2	2 9	6 8	.....	

K.—Railway post-office lines, route-agents, and mail-route messenger service in

Number of route.	Contract designation, terminus of route.	Corporate title of company.	Railway mail service, designation.	Railway post-office, route-agent, or mail-route messenger.	Distance.
20011	Elizabethtown, Paducah.	Paducah and Elizabeth-town	Louisville and Paducah.	R. A.	185
20019	Louisville, Cecilian	Louisville, Nashville and Great Southern.	Louisville and Paducah.	R. A.	48
20017	Mount Sterling, Lexington.	Louisville, Cincinnati and Lexington.	Mount Sterling and Lexington.	M. R. M.	34
20015	Owensboro', Owensboro' Junction.	Evansville Owensboro' and Nashville.	Owensboro' and Owensboro' Junction.	M. R. M.	36
20014	Willard, Greenup	Eastern Kentucky.	Greenup and Willard	M. R. M.	25
21002	Pittsburgh, Chicago	Pittsburgh, Fort Wayne and Chicago.	Pittsburgh and Chicago	R. P. O.	469
21003	Pittsburgh, Bellaire (part).	Cleveland and Pittsburgh.	Cleveland and Pittsburgh.	R. A.	48
21006	Cleveland, Wellsville	Cleveland and Pittsburgh	Cleveland and Pittsburgh.	R. A.	102
21006	Cleveland, Hudson (part).	Cleveland and Pittsburgh	Cleveland, Hudson and Columbus.	R. A.	26
21004	Hudson, Columbus	Cleveland, Mount Vernon and Columbus.	Cleveland, Hudson and Columbus.	R. A.	146
21001	Benwood, Newark	Baltimore and Ohio	Grafton and Chicago	R. P. O.	105
21010	Newark, Chicago Junction.				88
21047	Chicago Junction, Chicago.				271
10003	Baltimore, Wheeling (part).	Pittsburgh, Fort Wayne and Chicago.	Cresline and Chicago	R. A.	96
21002	Pittsburgh, Chicago (part).				280
21013	Delaware, Columbus				25
21014	Columbus, Xenia	Cleveland, Columbus, Cincinnati and Indianapolis.	Delaware and Columbus.	M. R. M.	35
21027	Xenia, Cincinnati	Pittsburgh, Cincinnati and Saint Louis.	Columbus and Cincinnati.	R. A.	66
21015	Xenia, Cincinnati (part)	do	Dresden and Cincinnati.	R. A.	26
21029	Dresden, Morrow	do	Xenia and Richmond.	R. A.	149
21011	Xenia, Dayton	do	Xenia and Richmond.	R. A.	42
21030	Dayton, Richmond	Cincinnati, Sandusky and Cleveland.	Sandusky and Cincinnati.	R. A.	121
21012	Sandusky, Springfield.	Cleveland, Columbus, Cincinnati and Indianapolis.	Sandusky and Cincinnati.	R. A.	80
21042	Springfield, Cincinnati (part).	Baltimore and Ohio	Sandusky and Newark.	R. A.	116
21010	Sandusky, Newark	Lake Erie and Louisville.	Fremont and Celina.	R. A.	163
21020	Fremont, Celina	Marietta and Cincinnati	Hamden & Portsmouth.	R. A.	56
21018	Hamden, Portsmouth	Wabash	Toledo and La Fayette	R. P. O.	196
21019	Toledo, La Fayette	Pittsburgh, Cincinnati and Saint Louis.	Pittsburgh and Cincinnati.	R. P. O.	55
21014	Columbus, Xenia	Marietta and Cincinnati	Grafton and Cincinnati.	R. P. O.	66
21027	Xenia, Cincinnati	Baltimore and Ohio	Grafton and Cincinnati.	R. P. O.	193
21032	Pittsburgh, Columbus.	Cincinnati, Richmond and Chicago.	Grafton and Cincinnati.	R. P. O.	185
21028	Parkersburg, Cincinnati.	Cincinnati, Hamilton and Dayton.	Grafton and Cincinnati.	R. P. O.	105
12002	Grafton, Parkersburg	Graud Rapids and Indianapolis.	Kalamazoo and Cincinnati.	R. A.	45
21025	Richmond, Hamilton	do	Kalamazoo and Cincinnati.	R. A.	27
21026	Hamilton, Cincinnati	do	Kalamazoo and Cincinnati.	R. A.	91
22021	Richmond, Fort Wayne	do	Kalamazoo and Cincinnati.	R. A.	83
24018	Fort Wayne, Kalamazoo (part).	White Water Valley	Fort Wayne and Cincinnati.	R. A.	73
21031	Hagerstown, North Bend.	Indianapolis, Cincinnati and La Fayette.	Fort Wayne and Cincinnati.	R. A.	15
22003	Indianapolis, Cincinnati (part).	Fort Wayne, Muncie and Cincinnati.	Fort Wayne and Cincinnati.	R. A.	100
22020	Fort Wayne, Connersville.	Columbus & Hocking Valley	Columbus and Athens.	R. A.	77
21036	Columbus, Athens	Pittsburgh, Cincinnati and Saint Louis.	Columbus and Athens.	R. A.	198
21015	Columbus, Indianapolis	Saint Louis, Vandalia, Terre Haute and Indianapolis.	Pittsburgh and Saint Louis.	R. P. O.	193
21032	Pittsburgh, Columbus		Pittsburgh and Saint Louis.	R. P. O.	73
22002	Indianapolis, Terre Haute.				165
23031	Terre Haute, East Saint Louis.				

operation in the United States on the 30th of June, 1879—Continued.

Annual miles of service.	Number of round trips with clerks and agents per week.	Number of railway post-office cars or cars in which there are mail apartments.	Dimension of cars or apartments.		Day or night service.	Number of round trips per week by express mail over whole route.	Number of round trips per week over portion of route, and between what points.
			Length.	Width.			
			<i>Ft. In.</i>	<i>Ft. In.</i>			
135,780	7	3	11 6	7 6	Day		
85,040							
21,284	6	1	11 6	7 6	Day		
22,536	6	1	9 0	6 0	do		
21,910	6	1	10 0	5 0	do		
841,640	7	5	59 0	8 4	Day and night		
80,048	6	5	13 0	9 0	Day	6	
63,852	6						
16,276	6	3	13 0	9 0	Day	6	
91,396	6						
76,650	7	5	51 8	9 4	Day	6	
64,240	7						
197,830	7						
69,350	7						
175,280	6	3	24 3	8 11	Day	6	
15,650	6	1	10 8	8 9	do	7	
21,910	6	1	20 1	8 5	do	6	
41,316	6	1	15 8	8 7			
45,072	12	4	14 0	7 0	Day		6, Washington C. H. to Morrow.
186,548	12						
10,642	6	1	19 6	8 6	Day	6	
26,292	6						
82,006	6	2	14 0	9 0	Day	7	
59,080	6						
72,616	6	1	18 3	8 6	Day		
		1	17 1	6 10			
64,478	6	2	12 1	7 0	Day		6, Saint Mary's to Minster.
35,056	6	1	14 6	9 6	do	6	
123,948	6	2	36 0	10 0	Day	7	
		1	45 0	9 4			
80,300	14	23	00 0	8 0	Day and night		22 cars between New York, Cincinnati, and Saint Louis.
96,360	14	23	00 0	8 0	do		
281,780	14	23	00 0	8 0			
142,350	7	2	51 8	9 4	Day	7	
76,650	7						
28,170	6	3	13 2	7 0	Day	6	
16,962	6						
56,966	6						
58,218	6						
45,698	6	3	12 0	7 8	Day		6, Cincinnati to Brookville.
9,390	6						
68,234	6						
48,202	6	3	15 11	9 3	Day	6	
274,480	14	22	60 0	8 4	Day and night	6	
281,780	14				do	6	
106,580	14						
240,900	14						

K.—Railway post-office lines, route-agents, and mail-route messenger service in

Number of route.	Contract designation, termini of route.	Corporate title of company.	Railway mail service, designation.	Railway post-office, route-agent, or mail-route messenger.	Distance.
21013	Pittsburgh, Bellaire (part).	Cleveland and Pittsburgh ..	Pittsburgh and Bellaire.	R. A.	5
21008	Bayard, New Philadelphia.	.....do	Bayard and New Philadelphia.	M. R. M.	2
21016	Galion, Indianapolis ..	} Cleveland, Columbus, Cincinnati and Indianapolis.	Cleveland and Indianapolis.	R. P. O.	24
21042	Cleveland, Cincinnati (part).				
21042	Cleveland, Cincinnati ..	.....do	Cleveland and Cincinnati.	R. P. O.	245
21035	Youngstown, Cross Cut	Pittsburgh, Fort Wayne and Chicago.	Ashtabula and New Castle.	R. A.	23
21044	Harbor, Youngstown ..	Ashtabula, Youngstown and Painesville.			
21040	Canal Dover, Marietta.	Marietta, Pittsburgh and Cleveland.	Canal Dover and Marietta.	R. A.	100
21042	Cleveland, Cincinnati (part).	Cleveland, Columbus, Cincinnati and Indianapolis.	Kent and Cincinnati..	R. A.	56
22034	Salamanca, Dayton (part).	Atlantic and Great Western.			
22083	Frankfort, Kokomo ..	Frankfort and Kokomo ..	Kokomo and Frankfort.	M. R. M.	23
21041	Loraline, Uhricksville ..	Cleveland, Tuscarawas Valley and Wheeling.			
21038	Newark, Shawnee	Baltimore and Ohio	Newark and Shawnee..	M. R. M.	4
21021	Cincinnati, Somerset ..	Cincinnati Southern			
21025	Richmond, Hamilton ..	Cincinnati, Richmond and Chicago.	Chicago, Richmond and Cincinnati.	R. A.	27
21026	Hamilton, Cincinnati (part).	Cincinnati, Hamilton and Dayton.			
22009	Chicago, Richmond ..	Pittsburgh, Cincinnati and Saint Louis.	Cincinnati, Hamilton and Indianapolis.	R. A.	23
21024	Hamilton, Indianapolis ..	Cincinnati, Hamilton and Indianapolis.			
21026	Cincinnati, Hamilton (part).	Cincinnati, Hamilton and Dayton.	Columbus and Springfield.	M. R. M.	4
21023	Columbus, Springfield ..	Cincinnati, Sandusky and Cleveland.			
21087	Niles, New Lisbon	Atlantic and Great Western	Cleveland and New Lisbon.	R. A.	90
21040	Canal Dover, Marietta	Marietta, Pittsburgh and Cleveland.	Canal Dover and Marietta.	R. A.	100
21022	Union City, Dayton ...	Dayton and Union	Union City and Dayton.	M. R. M.	45
21023	Toledo, Dayton	Dayton and Michigan			
21026	Dayton, Cincinnati ...	Cincinnati, Hamilton and Dayton.	Toledo and Cincinnati.	R. A.	10
21046	Painesville, Youngstown.	Painesville and Youngstown			
21084	Salamanca, Dayton (part).	Atlantic and Great Western	Painesville and Youngstown.	R. A.	80
21043	Toledo, Mansfield ..	Pennsylvania	Salamanca and Kent ..	R. A.	192
21047	Chicago Junction, Chicago.	Baltimore and Ohio	Toledo and Mansfield ..	R. A.	2
21052	Cincinnati, Scott	Cincinnati and Eastern	Chicago Junction and Chicago.	R. A.	27 1/2
21055	Cleveland, Sharpsville	Atlantic and Great Western.	Cincinnati, Batavia and Portsmouth.	R. A.	4
	Branch, Cleveland, Dalton.	East Tennessee, Virginia and Georgia.	Cleveland and Sharpsville.	R. A.	2
21058	Jackson, Springfield ..	Springfield, Jackson and Pomeroy.	Cleveland and Dalton ..	M. R. M.	3
21051	Columbus, Portsmouth	Scioto Valley	Springfield and Jackson	R. A.	2
21054	Dayton, Musselman's	Dayton and Southeastern ..	Columbus and Portsmouth.	R. A.	18
22002	Indianapolis, Terre Haute.	} Saint Louis, Vandalia, Terre Haute and Indianapolis.	Dayton and Jackson ..	M. R. M.	2
23031	Terre Haute, East Saint Louis.		Indianapolis, Vandalia and Saint Louis.	R. A.	16
22002	Indianapolis, Terre Haute.	.....do	Indianapolis and Terre Haute.	R. A.	1

operation in the United States on the 30th of June, 1879—Continued.

Annual miles of service.	Number of round trips with clerks or agents per week.	Number of railway post-office cars or cars in which there are mail apartments.	Dimension of cars or apartments.		Day or night service.	Number of round trips per week by express mail over whole route.	Number of round trips per week over portion of route, and between what points.
			Length.	Width.			
59,470	6	3	<i>Ft. In.</i> 13 0	<i>Ft. In.</i> 9 0	Day	6	
20,032	6	1	14 8	8 11	do		
148,920	7	2	39 2	9 2	do	7	
57,670	7						
332,220	13	3	39 2	9 2	Day and night.	6	
14,398	6	2	24 3	8 11	Day		6, Ashtabula to Youngstown.
38,812	6				do		
62,600	6	1	8 2	6 11	Day		
35,056	6	6	14 4	7 10	do	7	
143,810	6				do		
15,650	6	1	10 0	8 0	Day		6, Grafton to Massillon.
63,852	6	2	14 0	7 9	do		
27,544	6	2	12 0	8 6	Day	6	
96,908	6	2	15 0	7 6	do		6, Cincinnati to Danville, Ky.
28,170	6				do		
16,902	6	4	13 0	9 0	Day	7	
140,850	6				do		
58,844	6	4	10 6	7 2	Day	7	
16,902	6				do		
23,796	6	1	13 4	6 8	Day	6	
56,340	6	2	15 2	7 3	do		
62,600	6	1	8 2	6 11	do		
30,048	6	1	11 0	7 3	do	6	
89,518	6	2	19 9	7 2	do	7	
37,560	6	1	17 9	6 4	do		
37,560	6	1	12 0	6 0	Day	6	
120,192	6	6	14 4	7 10	do	7	
55,088	6	2	24 3	8 11	do	6	
109,648	6	3	22 0	8 6	do	7	
30,048	6	2	12 0	6 2	do	6	
52,584	6	1	14 4	7 10	do		6, Cleveland to Sharon.
21,170	7	2	11 10	6 11	do	7	
59,860					do	6	
62,600	6	2	9 5	6 9	do	6	
30,048	6	1	8 2	7 6	do		
45,698	6	4	19 0	7 5	do		
103,290	6				do		
45,698	6	1	10 4	6 10	Day		

K.—Railway post-office lines, route-agents, and mail-route messenger service in

Number of route.	Contract designation, termini of route.	Corporate title of company.	Railway mail service, designation.	Railway post-office, route-agent, or mail-route messenger.	Distance.
					<i>Miles.</i>
22001	Indianapolis, Vincennes.	Indianapolis and Vincennes.	Indianapolis and Vincennes.	R. A.	116
22003	Indianapolis, Cincinnati.	Indianapolis, Cincinnati and La Fayette.			113
22005	La Fayette, Indianapolis.	.....do.....			68
22029	Kankakee, La Fayette.	Cincinnati, La Fayette and Chicago.	Chicago and Cincinnati.	R. P. O.	76
22020	Chicago, Kankakee	Illinois Central			55
22004	Peru, Indianapolis	Indianapolis, Peru and Chicago.			78
22015	La Porte, Peru	Chicago, Cincinnati and Louisville.	Michigan City and Indianapolis.	R. A.	73
22026	Michigan City, La Porte.	Indianapolis, Peru and Chicago.			12
22008	Columbus, Madison	Jefferson, Madison and Indianapolis.	Columbus and Madison.	R. A.	46
22007	Indianapolis, New Albany.	.....do.....	Indianapolis and Louisville.	R. A.	114
22011	Cambridge City, Columbus.	.....do.....	Cambridge City and Columbus.	R. A.	68
22010	Cincinnati, East Saint Louis.	Ohio and Mississippi	Cincinnati and Saint Louis.	R. P. O.	241
22027	Butler, Logansport	Eel River and Illinois	Butler and Logansport.	R. A.	95
22008	Michigan City, New Albany (part).	Louisville, New Albany and Chicago.	La Fayette and Louisville.	R. A.	190
22008	.....do.....	.....do.....	Michigan City and La Fayette.	R. A.	90
22018	Indianapolis, Peoria	Indianapolis, Bloomington and Western.	Indianapolis and Peoria.	R. A.	212
22016	Fairland, Martinsville.	Fairland, Franklin and Martinsville.	Fairland and Martinsville.	M. R. M.	38
22017	Logansport, Bradford.	Pittsburgh, Cincinnati and Saint Louis.	Logansport and Bradford.	R. A.	115
22019	North Vernon, Jeffersonville.	Ohio and Mississippi	Cincinnati North Vernon and Louisville.	R. A.	126
22012	Terre Haute, Evansville.	Evansville and Terre Haute.	Terre Haute and Evansville.	R. A.	110
22024	Danville, Terre Haute.	Evansville, Terre Haute and Chicago.	Danville and Terre Haute.	M. R. M.	57
22022	Goshen, Anderson	Cincinnati, Wabash and Michigan.	Goshen and Anderson ..	R. A.	114
22025	Indianapolis, Terre Haute.	.....do.....	Indianapolis and Saint Louis.	R. P. O.	72
22028	Terre Haute, East Saint Louis.	Indianapolis and Saint Louis.	.....do.....		180
22028	Logansport, Rockville.	Logansport, Crawfordsville and Southwestern.	Logansport and Terre Haute.	R. A.	92
22013	Rockville, Terre Haute.	Cincinnati, Rockport and Southwestern.	Jasper and Rockport ..	M. R. M.	38
22034	Rockport, Huntingburg.	La Fayette, Muncie and Bloomington.			
22035	Muncie, La Fayette ..	La Fayette, Bloomington and Mississippi.	Muncie and Bloomington.	R. A.	115
22026	La Fayette, Bloomington.	Indianapolis, Delphi and Chicago.	.....do.....	R. A.	106
22038	Rensselaer, Delphi	Cincinnati and Terre Haute.	Rensselaer and Delphi.	M. R. M.	29
22080	Terre Haute, Martinsville.	Bedford Springs, Owensville and Bloomington.	Terre Haute and Martinsville.	M. R. M.	26
22036	Switz City, Bedford ..	Columbus and Toledo	Switz City and Bedford.	M. R. M.	41
21053	Toledo, Columbus ....	.....do.....	Toledo and Columbus ..	R. A.	125
21019	Toledo, Quincy .....	.....do.....	La Fayette and Quincy.	R. P. O.	370
	Branch, Bluffs, Naples.	Wabash	Bluffs and Hannibal ..	R. A.	4
	Branch, Clayton, Keokuk.	Pittsburgh, Cincinnati and Saint Louis.	Keokuk and Clayton ..	R. A.	61
22014	State Line, Logansport.	Chicago and Northwestern.	Logansport and Warsaw.	R. A.	43
22001	Chicago, Milwaukee ..	.....do.....	Milwaukee and Chicago.	R. A.	85
22002	Chicago, Freeport .....	.....do.....	Chicago and Dubuque ..	R. P. O.	121
22003	Chicago, Union Pacific Transfer.	.....do.....	Chicago and Cedar Rapids.	R. P. O.	219
	.....do.....	.....do.....	Cedar Rapids and Council Bluffs.	R. A.	370

operation in the United States on the 30th of June, 1879—Continued.

Annual miles of service.	Number of round trips with clerks or agents per week.	Number of railway post-office cars, or cars in which there are mail apartments.	Dimension of cars or apartments.		Day or night service.	Number of round trips per week by express mail over whole route.	Number of round trips per week over portion of route, and between what points.
			Length.	Width.			
72, 616	6	1	<i>Ft. in.</i> 11 5	<i>Ft. in.</i> 9 1	Day	6	
153, 228	13	1	12 10	6 10	.....		6, Indianapolis to Cincinnati.
89, 496	13	3	40 0	9 5	Day and night		6, La Fayette to Indianapolis.
103, 056	13	3	50 0	9 5	.....do		
74, 580	13				.....	
46, 828	6				.....	
45, 608	6	3	12 0	7 0	Day	6	
7, 512	6				.....	
28, 796	6	2	11 0	6 0	Day	8	
166, 440	14	3	12 0	7 0	Day and night	6	
42, 568	6	1	11 0	6 0	Day	6	
213, 466	6	1	45 0	9 9	.....do	7	6, Cincinnati to North Vernon.
59, 470	6	2	50 0	9 9	.....do		
123, 948	6	2	11 3	7 3	Day	6	
	6	3	9 6	6 3	.....do	6	
56, 840	6	2	9 6	6 3	.....do	6	
132, 712	6	4	12 0	8 10	.....do	7	
23, 788	6	1	11 0	7 0	.....do		
71, 990	6	2	11 10	8 9	.....do	6	
80, 128	6	1	13 0	8 7	.....do	6	
68, 880	6	2	12 6	8 0	.....do	7	
35, 682	6	2	9 6	6 6	.....do	6	
71, 364	6	2	10 0	6 6	.....do		6, Wabash to Anderson.
45, 072	6	3	40 0	9 0	.....do	6	
118, 314	6				.....	
57, 582	6	3	11 0	7 3	Day	6	
14, 398	6				.....	
23, 788	6	1	10 0	8 0	Day		
71, 990	6	3	14 0	7 5	.....do	6	
66, 356	6				.....	
18, 154	6				Day		
16, 276	6				.....do		
25, 666	6	1	10 0	6 6	.....do		
78, 250	6	4	15 11	9 3	.....do		
169, 020	6	3	50 8	10 0	.....do	7	6, Tolono to Decatur.
1, 504	6	1	12 0	9 0	.....do	7	
26, 292	6	1	20 0	9 4	.....do	6	
38, 186	6	3	18 0	8 7	.....do		6, State Line to Kentland.
106, 420	12	2	35 4	9 3	.....do	14	
75, 746	6	2	35 8	9 5	.....do	6	6, Chicago to Elgin.
247, 188	12	2	50 0	9 5	Day and night		6, Chicago to Courtland station.
9, 020	6	3	35 0	9 4	.....do	6	3, Clarence to Cedar Rapids.
		3	35 0	9 4	Day		

K.—Railway post-office lines, route-agents, and mail-route messenger service in

Number of route.	Contract designation, termini of route.	Corporate title of company.	Railway mail service, designation.	Railway post-office, route-agent, or mail-route messenger.	Distance.
					Miles.
23004	Elgin, Geneva	Chicago and Northwestern	Geneva and Elgin	R. A.	44
23005	Sterling, East Saint Louis.	Chicago, Burlington and Quincy.	Sterling and Rock Island.	M. R. M.	52
			Rock Island and Saint Louis.	R. A.	267
23007	Chicago, Burlington ..	.....do	Chicago and Burlington ..	R. P. O.	207
			Chicago, Foreston, and Dubuque.	R. P. O.	20
			Chicago and Streator ..	R. A.	30
	Branch, Galva, Sagetown.	.....do	Galva and Burlington ..	R. A.	71
23008	Rushville, Yates City ..	.....do	Yates City and Rushville.	R. A.	60
			Buda and Lewiston	R. A.	20
	Branch, Elmwood, Buda.	.....do	do	R. A.	44
23009	Peoria, Galesburgh ..	.....do	Peoria and Galesburgh ..	R. A.	53
			Buda and Lewiston	R. A.	3
23010	Galesburgh, Quincy ..	.....do	Galesburgh and Quincy ..	R. P. O.	100
23011	Burlington, Quincy ..	.....do	Burlington and Quincy ..	R. A.	72
23012	Streator, Aurora .....	.....do	Chicago and Streator ..	R. A.	61
	Branch, Aurora, Batavia.	.....do			9
23013	Mendota, Clinton .....	.....do	Mendota and Clinton ..	R. A.	64
23014	Rock Falls, Shabbona ..	.....do	Shabbona and Rock Falls.	M. R. M.	46
23015	Chicago, Davenport ..	Chicago, Rock Island and Pacific.	Chicago and Iowa City ..	R. P. O.	183
			Chicago and Davenport ..	R. P. O.	183
23016	Bureau Junction, Peoria.	.....do	Burlington Junction and Peoria.	R. A.	46
23017	Chicago, East Saint Louis.	Chicago and Alton	Chicago and Saint Louis.	R. P. O.	202
			Bloomington and Mexico.	R. P. O.	24
			Chicago and Peoria	R. A.	37
23018	Bloomington, East Saint Louis.	.....do	Bloomington and Mexico.	R. P. O.	119
			Quincy and Saint Louis ..	R. A.	79
23019	Washington, Dwight ..	.....do	Dwight and Washington.	R. A.	79
	Branch, Varna, Lacon.	.....do			10
23020	Chicago, Cairo	Illinois Central	Chicago and Centralia ..	R. P. O.	232
			Chicago and Tolono	R. P. O.	157
			Chicago and Cincinnati ..	R. P. O.	56
			Centralia and Cairo	R. P. O.	113
			Chicago and Dubuque ..	R. P. O.	60
23021	Dubuque, Centralia ..	.....do	Chicago, Foreston and Dubuque.	R. P. O.	82
			Freeport and Centralia ..	R. A.	275
23022	Joliet, Lake Station ..	Michigan Central	Lake Station, Indianapolis and Joliet.	M. R. M.	45
23023	Decatur, East Saint Louis.	Wabash	Decatur and Saint Louis ..	R. A.	112
23024	Peoria, Decatur	Pekin, Lincoln and Decatur.	Peoria and Decatur	R. A.	77
23025	Hannibal, Naples	Wabash	Bluffs and Hannibal	R. A.	66
	Branch, Maysville, Pittsfield.	.....do		None	6
23027	State Line, Warsaw ..	Toledo, Peoria and Warsaw.	Logansport and Warsaw.	R. A.	223
	Branch, LeHarpe, Burlington.	.....do		None	30
23029	Urbana, Havana	Indianapolis, Bloomington and Western Extension.	Urbana and Havana	R. A.	102
	Branch, White Heath, Decatur.	.....do	White Heath and Decatur.	None	30
23030	East Saint Louis, Du Quoin.	Saint Louis, Alton and Terre Haute.	Saint Louis and Du Quoin.	R. A.	71
23032	East Saint Louis, Nashville.	Saint Louis and South Eastern.	Evansville and Saint Louis.	R. A.	102

operation in the United States on the 30th of June, 1879—Continued.

Annual miles of service.	Number of round trips with clerks or agents per week.	Number of railway post-office cars or cars in which there are mail apartments.	Dimension of car or apartments.		Day or night service.	Number of round trips per week by express mail over whole route.	Number of round trips per week over portion of route, and between what points.
			Length.	Width.			
			<i>Ft. in.</i>	<i>Ft. in.</i>			
27,544	6	1	9 6	9 5	Day		
82,552	6	2	8 11	4 10	do		
154,622	6	2	14 8	9 0	do	6	
259,164	12	4	54 8	8 8	Day and night	6	6, Galesburgh to Burlington.
24,414	6	3	35 0	8 6	Night	6	
23,788	6	1	22 5	8 6	Day	6	
44,446	6	1	6 10	6 10	do		6, Galva to Aledo; 12, New Boston to Sagetown.
39,438	6	1	14 0	6 10	Day		
18,780	6	1	13 4	6 6	do		
27,544	6	1	13 4	6 6	do		
33,178	6	1	14 2	6 6	do	6	6, Galesburgh to Yates City.
1,878	6	1	13 4	6 6	do		
125,200	12	3	43 10	8 6	Day and night		
90,144	6	1	19 8	8 6	Day		
38,186	6	1	22 5	8 6	do	6	
					do	6	
40,064	6	1	10 1	7 0	Day		6, Mendota to Denrock.
28,796	6	1	6 10	6 6	do		
120,818	6	2	50 0	9 6	do		6, Chicago to Washington Heights.
120,818	6	2	42 0	9 6	Night		
28,796	6	1	20 0	9 6	Day	6	
176,532	6	2	44 6	8 0	do	7	6, Chicago to Pontiac.
21,284	6	3	25 6	8 0	do		6, Springfield to Virden.
23,162	6				do		
68,880	6	3	25 6	8 0	Night		6, Roodhouse to Saint Louis.
43,820	6	2	17 6	8 8	Day		
43,820	6	1	13 9	9 5	do		
157,752	6	3	44 4	9 0	Day	6	
100,010	7	2	41 5	9 13	Night	6	3, Chicago to Tolono.
75,936	13	4	49 4	9 0	Day and night		6, Chicago to Hyde Park.
70,738	6	1	44 4	9 0	Day	7	
43,194	6	2	35 8	9 5	do		
51,332	6	3	35 0	8 6	Night		
172,150	6	3	19 3	9 0	Day		6, Foreston to Centralia.
28,170	6	2	16 9	9 0	do		
		1	7 1	6 3	Day		
70,738	6	1	20 0	9 4	do	9	
		1	12 0	9 10	do		
48,202	6	2	10 0	7 8	do	3	
28,796	6	1	12 0	9 10	do	7	
					do	24	
142,728	6	3	18 0	8 7	Day	6	4, Sheldon to Peoria; 3, Peoria to La Harpe.
		1	17 10	9 4	do	6	
63,852	6	2	9 9	7 2	do		
		1	10 5	6 10	do	6	
45,072	6	2	18 0	7 0	do	7	12, East Saint Louis to Belleville.
101,412	6	4	11 10	9 0	do	7	

K.—Railway post-office lines, route-agents, and mail-route messenger service in

Number of route.	Contract designation, termini of route.	Corporate title of company.	Railway mail service, designation.	Railway post-office, route-agent, or mail-route messenger.	Distance.
					<i>Miles.</i>
23033	Branch, McLeansborough, Shawneetown. Bearistown, Shawneetown.	Saint Louis and Southeastern Ohio and Mississippi	McLeansborough and Shawneetown. Beardstown and Shawneetown.	M. R. M. R. A.	49 228
23034	Springfield, Gilman ..	Illinois Central	Gilman and Springfield.	R. A.	112
23035	Chicago, Milwaukee ..	Chicago, Milwaukee and Saint Paul,	Chicago and La Crosse.	R. P. O.	85
23036	Aurora, Foreston	Chicago and Iowa	Foreston and Aurora .. Chicago, Foreston and Dubuque.	R. A. R. P. O.	81 81
23037	Vincennes, Cairo	Cairo, Vincennes	Vincennes and Cairo ..	R. A.	158
23038	Peoria, Jacksonville ..	Peoria, Pekin and Jacksonville.	Peoria and Jacksonville, Ill.	R. A.	83
23040	Peoria, Rock Island ..	Rock Island and Peoria ..	Rock Island and Peoria.	R. A.	91
23041	Quincy, Hannibal	Chicago, Burlington and Quincy.	Quincy and Saint Louis ..	R. A.	13
	Branch, Fall Creek, Louisiana.	.....do .....	.....do	R. A.	20
23042	Chicago, Danville	Chicago and Eastern	Chicago and Danville ..	R. A.	128
23043	Streator, Altamont	Chicago and Paducah	Streator and Altamont.	R. A.	157
23044	Mattoon, Decatur	Decatur, Mattoon and Southern.	Mattoon and Decatur ..	M. R. M.	40
23045	Carbondale, Marion ..	Carbondale and Shawneetown.	.....do	None ..	17
23046	Jacksonville, Virden ..	Jacksonville, Northwestern and Southeastern.	Virden and Jacksonville.	M. R. M.	31
23047	Chester, Tamaroa	Wabash, Chester and Western.	Tamaroa and Chester ..	M. R. M.	41
23048	Terre Haute, Peoria ..	Illinois Midland	Peoria and Terre Haute.	R. A.	176
23049	Springfield, Havana ..	Springfield and Northwestern.	Havana and Springfield.	R. A.	47
23050	Vincennes, Danville ..	Paris and Danville	Vincennes and Danville	R. A.	113
23051	Joliet, Peoria	Chicago, Pekin and Western.	Chicago and Peoria ..	R. A.	124
23053	East Saint Louis, Cairo	Cairo and Saint Louis	Saint Louis and Cairo ..	R. A.	147
23054	Chicago, Byron	Chicago and Pacific	Chicago and Byron ..	R. A.	86
23055	Decatur, Bruin Junction.	Indianapolis, Decatur and Springfield.	Guion and Decatur ..	R. A.	161
23060	Parkersburg, Mattoon	Grayville and Mattoon	Mattoon and Parkersburg.	R. A.	73
24031	Fort Howard, Iahpeming.	Chicago and Northwestern ..	Iahpeming and Fort Howard.	R. A.	179
24041	Marquette, L'Ance ..	Marquette, Houghton and Ontonagon.	Marquette and L'Ance.	R. A.	63
24001	Toledo, Detroit	Detroit branch, Lake Shore and Michigan Southern.	Detroit and Toledo	R. P. O.	65
		.....do .....	.....do	R. A.	26
24002	Monroe, Adrian	Monroe branch, Lake Shore and Michigan Southern.	Monroe and Adrian	M. R. M.	33
24008	Adrian, Jackson	Jackson branch Lake Shore and Michigan Southern.	Jackson and Adrian	R. A.	46
		.....do	Bay City, Wayne and Detroit.	R. A.	18
24005	Detroit, Chicago	Michigan Central	Detroit and Chicago ..	R. P. O.	284
		.....do .....	.....do	R. A.	76
		.....do .....	.....do	R. A.	94
		.....do	Detroit, Jackson and Grand Rapids.	R. A.	76
24004	White Pigeon, Grand Rapids.	Kalamazoo Division, Lake Shore and Michigan Southern.	Grand Rapids and Elkhart.	R. A.	94
24006	Detroit, Grand Haven.	Detroit, Grand Haven, and Milwaukee.	Detroit and Grand Haven.	R. A.	189
24008	Jackson, Fort Wayne.	Fort Wayne, Jackson, and Saginaw.	Jackson and Fort Wayne.	R. A.	100
24007	Detroit, Port Huron ..	Grand Trunk	Port Huron and Detroit.	M. R. M.	67
24009	Jackson, Gaylord	Mackinaw Division Michigan Central Railroad.	Gaylord and Bay City ..	R. A.	122
		Saginaw Division Michigan Central Railroad.	Bay City and Jackson ..	R. A.	116
24010	Jackson, Grand Rapids	Grand Rapids Division Michigan Central.	Detroit, Jackson and Grand Rapids.	R. A.	94

operation in the United States on the 30th of June, 1879—Continued.

Annual miles of serv- ice.	Number of round trips with clerks or agents per week.	Number of railway post-office cars or cars in which there are mail apartments.	Dimension of cars or apart- ments.		Day or night service.	Number of round trips per week by express mail over whole route.	Number of round trips per week over portion of route, and between what points.
			Length.	Width.			
25, 040	6	1	6 4	3 0	Day	6	6, Beardstown to Pana; 6, Flora to Fairfield. *6, Gilman to Gibson City. 3, Wadsworth to Milwaukee; 12, Western Union to Milwaukee.
142, 728	6	3	12 8	8 1	do		
70, 112	6	2	11 9	9 4	do		
115, 280	13	5	50 0	9 2	Day and night.	3	
50, 706	6	3			Day		
50, 706	6	3	35 0	8 6	Night		
98, 908	6	3	11 9	6 9	Day		
51, 958	6	2	13 0	7 6	do	3	
56, 966	6	2	9 9	8 0	do	6	
8, 138	6	1	10 11	7 0	do	12	
18, 780	6	1	10 11	7 0	do		
80, 128	6	2	17 9	6 6	do	7	
98, 282	6	4	11 0	7 0	do		
25, 040	6	1	12 0	7 4	do		
						12	
19, 406	6	1	7 0	6 5	Day		6, Marquette to Negaunee.
25, 666	6	1	12 0	6 3	do		
110, 176	6	2	20 9	9 0	do		
29, 422	6	1	12 6	6 3	do		
70, 738	6	2	12 0	7 0	do		
77, 624	6	2	10 0	7 5	do		
92, 922	6	3	10 0	6 6	do		
55, 088	6	1	10 6	6 10	do		
63, 226	6	2	16 8	7 3	do		
45, 698	6	1	10 0	7 0	do		
130, 670	7	2	19 0	7 0	do		
39, 438	6	3	12 0	7 2	do		
23, 725	3	1	20 7	8 5	Day and night		
16, 276	6	1	16 0	9 3	Day		
20, 658	6	1	13 0	9 0	do		
28, 796	6	1	12 0	8 4	Day and night.		6, Detroit to Jackson. 6, Niles to Chicago. 6, Detroit to Jackson. 6, White Pigeon to Elkhart.
11, 268	6	1	15 0	9 0	Day		
177, 784	6	2	44 0	9 2	Day and night.	12	
47, 576	6	1	10 8	8 8	Day		
58, 844	6	1	10 10	7 0	do		
47, 576	6	1	11 0	7 0	do		
58, 844	6	1	10 10	8 0	do		
	6	1	16 0	9 0	do	6	
118, 314	6	1	21 0	9 2	Day and night.		
62, 600	6	1	22 0	9 2	Day		
	6	1	10 6	7 6	Day		
28, 812	6	1	24 0	6 0	Day and night.	9	
76, 372	6	1	10 7	8 4	Day		
72, 616	6	1	10 10	8 4	do		
58, 844	6	2	10 10	8 8	Day	13	
	6	1	13 6	8 8	do		

K.—Railway post-office lines, route-agents, and mail-route messenger service in

Number of route.	Contract designation, termini of route.	Corporate title of company.	Railway mail service, designation.	Railway post-office, route-agent, or mail-route messenger.	Distance.
24013	Detroit, Bay City	Detroit and Bay City	Bay City and Detroit...	R. A.	110
24015	Toledo, Ludington..	Flint and Pere Marquette...	Bay City, Wayne, and Detroit.	R. A.	91
	Branch, East Saginaw, Bay City.	Bay City Division Flint and Pere Marquette.	.....do	R. A.	13
		Flint and Pere Marquette...	Ludington and Toledo	R. A.	278
24018	Fort Wayne, Walton..	Grand Rapids and Indiana {	Cadillac and Kalamazoo	R. A.	147
			Petoskey and Grand Rapids	R. A.	119
24017	Detroit, Howard City.	Detroit, Lansing and Northern.	.....do	R. A.	100
24020	Lansing, Fort Wayne Junction.	Chicago and Lake Huron ...	Port Huron and Valparaiso.	R. A.	108
24019	Kalamazoo, South Haven.	South Haven Division Lake Shore and Michigan Southern.	Kalamazoo and South Haven.	M. R. M.	40
24021	New Buffalo, Pentwater.	Chicago and West Michigan	Pentwater and Nunica.	R. A.	60
			Grand Rapids and New Buffalo.	R. A.	90
			Big Rapids and Holland	R. A.	38
24022	Port Huron, Flint.....	Chicago and Lake Huron ...	Port Huron and Valparaiso.	R. A.	66
24021	Branch, Holland, Grand Rapids.	Chicago and West Michigan.	Grand Rapids and New Buffalo.	R. A.	25
24023	Allegan, Muskegon ...	Grand Haven	Muskegon and Allegan.	M. R. M.	58
24024	Ypsilanti, Bankers...	Detroit, Hilldale and Southwestern.	Ypsilanti and Bankers	M. R. M.	65
24026	Grand Rapids, White Cloud.	Grand Rapids, Newaygo, and Lake Shore.	White Cloud and Grand Rapids.	M. R. M.	46
24028	Jonesville, Lansing ...	Lansing Division Lake Shore and Michigan Southern.	Lansing and Jonesville.	R. A.	60
24025	Jackson, Niles	Air Line Division Michigan Central.	Detroit and Chicago ...	R. A.	103
24030	East Saginaw, Saint Louis.	Saginaw Valley and Saint Louis.	East Saginaw and Edmore.	R. A.	35
24033	Ionia, Blanchard	Stanton Branch Detroit, Lansing and Northern.	Blanchard and Ionia ...	M. R. M.	42
24032	Muskegon, Big Rapids	Big Rapids Branch Chicago and West Michigan.	Big Rapids and Holland	R. A.	53
24035	Toledo, Detroit	Toledo, Canada Southern, and Detroit.	Detroit and Fayette ...	M. R. M.	17
24036	Grosse Ile, Fayette...	Chicago and Canada Southern.	.....do	M. R. M.	67
24038	Walton, Petoskey	Grand Rapids and Indiana ..	Petoskey and Grand Rapids.	R. A.	72
24039	Flint, Lansing	Chicago and Northeastern ..	Port Huron and Valparaiso.	R. A.	51
24040	Saint Louis, Edmore ..	Chicago, Saginaw and Canada.	East Saginaw and Edmore.	R. A.	34
21007	Elyra, Millbury	See No. 8052.			
21045	Toledo, Elkhart				
25001	Milwaukee, North McGregor.	Chicago, Milwaukee and Saint Paul.	Milwaukee and Prairie du Chien.	R. A.	100
25002	Milwaukee, La Crosse.	.....do	Chicago and La Crosse.	R. P. O.	196
25003	Milwaukee, Berlin .....	.....do	Oshkosh and Milwaukee	R. A.	96
25004	Milton Junction, Monroe.	.....do	Milton Junction and Monroe.	R. A.	42
25005	Watertown, Madison..	.....do	Watertown and Madison.	M. R. M.	36
25006	Horicon, Portage .....	.....do	Horicon and Portage...	M. R. M.	44
25008	Oshkosh, Ripon .....	.....do	Oshkosh and Milwaukee	R. A.	20
25009	Chicago, Green Bay...	Chicago and Northwestern..	Fort Howard and Chicago.	R. P. O.	212

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Annual miles of service.	Number of round trips with clerks or agents per week.	Number of railway post-office cars or cars in which there are mail apartments.	Dimension of cars or apartments.		Day or night service.	Number of round trips per week by express mail over whole route.	Number of round trips per week over portion of route, and between what points.
			Length.	Width.			
			<i>Ft. In.</i>	<i>Ft. In.</i>			
68,800	6	1	14 4	9 0	Day and night.	12	6, East Saginaw and Wayne Junction.
56,906	6	1	15 0	9 0	Day		
8,138	6	1	15 0	9 0	Day and night.	15	
174,028	6	2	20 11	8 11	do		6, Cadillac and Kalamazoo.
92,022	6	1	14 5	6 9	Day		
74,494	6	2	13 0	7 0	do		6, Walton and Grand Rapids.
100,180	6	1	12 0	9 3	Day and night		
		1	13 0	9 3	do		
105,168	6	1	12 6	7 6	Day		
		1	13 6	6 6	do		
25,040	6	1	12 7	6 6	Day		
37,560	6	1	12 8	8 10	do		
56,340	6	1	13 3	9 0	Day and night.		
22,536	6	1	12 8	9 5	do		6, Muskegon and Holland.
		1	10 3	6 7	do		
41,316	6	1	12 6	7 6	Day		
		1	13 6	6 6	do		
15,650	6	1	13 3	9 1	Day and night.	6	
		1	12 8	9 5	do		
26,308	6	1	12 6	9 3	Day		
23,725	6	1	8 9	7 0	do		
28,798	6	1	8 9	7 0	do	6	
37,560	6	1	17 8	9 4	do		
64,478	6	2	10 8	8 8	do		
21,910	6	1	8 0	5 9	do	6	
26,292	6	1	10 4	6 8	do		
34,430	6	1	10 3	6 10	do		
10,642	6	1	16 0	9 3	Day and night.		6, Detroit to Slocum Junction.
41,942	6	1	16 0	9 3	do		6, Slocum Junction to Fayette.
45,073	6	2	13 0	7 0	Day		
31,926	6	1	12 6	7 6	do		
		1	13 6	6 6	do		
21,284	6	1	8 0	5 9	Day	6	
120,818	6	2	19 6	9 2	Day	6	6, Milwaukee to Melton Junction.
265,776	13	5	50 0	9 2	Day and night.		
60,096	6	1	18 9	9 2	Day	6	6, Ripon to Berlin.
26,292	6	1	13 4	7 8	do		12, Milton Junction to Janesville.
22,536	6	1	13 7	7 5	do		
27,544	6	1	20 0	7 6	do		
12,520	6	1	12 0	7 2	do	6	
151,492	6	2	50 0	10 0	do		14, Chicago to Harvard. 1, Harvard to Clinton. 7, Clinton to Watertown. 7, Fond du Lac to Green Bay.

K.—Railway post-offices lines, route-agents, and mail-route messenger service in

Number of route.	Contract designation, termini of route.	Corporate title of company.	Railway mail service, designation.	Railway post-office, route-agent, or mail-route messenger.	Distance.
					Miles.
25010	Caledonia Station, Winona Junction.	Chicago and Northwestern	Elroy and Harvard	R. A.	135
25011	Kenosha, Rockford	do	Elroy and Sleepy Eye	R. A.	55
25012	Winona, Winona Junction.	do	Kenosha and Rockford	R. A.	73
25013	Milwaukee, Fond du Lac.	Chicago and Northwestern	Elroy and Harvard	R. A.	15
25014	Elroy, Saint Paul	do	Elroy and Sleepy Eye	R. A.	30
25015	Green Bay, Winona	do	Fond du Lac and Milwaukee	R. A.	64
25016	Milwaukee, Green Bay Branch, Hilbert, Menasha, Ashland	Chicago, Saint Paul and Minneapolis.	Saint Paul and Elroy	R. A.	198
25017	Milwaukee, Green Bay Branch, Hilbert, Menasha, Ashland	Green Bay and Minnesota.	Green Bay and Winona	R. A.	214
25018	Milwaukee, Two Rivers, Branch, Manitowoc, Clintonville, Sheboygan, Princeton.	Wisconsin Central	Menasha and Milwaukee	R. A.	113
25019	Sheboygan, Princeton.	do	do	R. A.	16
25020	Tomah, Wausau	do	Phillips and Menasha	R. A.	172
25021	Madison, Portage	Milwaukee, Lake Shore and Western.	New London and Milwaukee.	R. A.	77
25022	Racine, Rock Island	do	do	R. A.	63
25023	Stevens Point, Portage	Sheboygan and Fond du Lac	Sheboygan and Princeton.	R. A.	78
25024	Hudson, Cumberland	Wisconsin Valley	Wausau and Tomah	R. A.	89
25025	Duluth, Bismarck	Chicago, Milwaukee and Saint Paul.	Portage and Madison	M. R. M.	39
25026	Saint Paul, Breckenridge.	Western Union	Racine and Rock Island	R. A.	197
25027	Saint Paul, Sauk Rapids.	Wisconsin Central	Stevens Point and Portage.	R. A.	71
25028	East Saint Cloud, Alexandria.	North Wisconsin	Cumberland and Hudson.	R. A.	59
25029	Saint Paul, Saint James	do	Saint Paul and Bismarck	R. A.	333
25030	White Bear Lake, Albert Lea.	Northern Pacific	Saint Vincent and Saint Paul.	R. A.	217
25031	Saint Paul, Duluth	Saint Paul, Minneapolis and Manitoba.	Saint Paul and Bismarck	R. A.	78
25032	Mendota, McGregor	do	Sauk Rapids and Alexandria.	R. A.	141
25033	Hastings, Montevideo	do	Saint Paul, Minneapolis and Sioux City.	R. A.	122
25034	Minneapolis, La Crosse	Saint Paul and Sioux City	Saint Paul, Minneapolis and Le.	R. A.	186
25035	Austin, Mason City	Minneapolis and Saint Louis.	Minneapolis and Albert Lea.	R. A.	155
25036	Saint Peter, Gary	Saint Paul and Duluth	Duluth and Saint Paul.	R. A.	267
25037	Winona, Saint Peter	Chicago, Milwaukee and Saint Paul.	Saint Paul and McGregor.	R. A.	157
25038	La Crosse, Jackson	do	Hastings and Montevideo.	R. A.	144
25039	Mankato, Wells	do	Minneapolis and La Crosse.	R. A.	7
25040	Saint James, Sioux City	do	Saint Paul and McGregor.	R. A.	40
25041	Worthington, Sioux Falls	do	Austin and Mason City	M. R. M.	43
25042	Sauk Rapids, Brainerd	Chicago and Northwestern	Elroy and Sleepy Eye	R. A.	165
27001	Burlington, Albert Lea	do	Sleepy Eye and Gary	R. A.	139
27002	Cedar Rapids, Postville	do	Elroy and Sleepy Eye	R. A.	216
27003	Cedar Rapids, Holland	Southern Minnesota	La Crosse and Jackson	R. A.	40
27004	Muscatine, Riverside	Central of Minnesota	Mankato and Wells	M. R. M.	143
		Sioux City and Saint Paul	Saint Paul and Sioux City.	R. A.	63
		Worthington and Sioux Falls	Worthington and Sioux Falls.	R. A.	60
		Northern Pacific	Saint Paul and Bismarck	R. A.	253
		Burlington, Cedar Rapids and Northern.	Albert Lea and Burlington.	R. A.	96
		do	Postville and Cedar Rapids.	R. A.	71
		do	Cedar Rapids and Holland.	R. A.	31
		do	Muscatine and Riverside.	M. R. M.	

operation in the United States on the 30th of June, 1879—Continued.

Annual miles of service.	Number of round trips with clerks or agents per week.	Number of railway post-office cars or cars in which there are mail apartments.	Dimension of cars or apartments.		Day or night service.	Number of round trips per week by express mail over whole route.	Number of round trips per week over portion of route, and between what points.
			Length.	Width.			
			<i>Ft. In.</i>	<i>Ft. In.</i>			
84, 510	6	2	36 0	9 6	Day	7	
34, 430	6	2	15 3	7 6	do	6	
45, 072	6	1	12 6	7 2	do		
9, 380	6	2	36 0	9 6	Day	7	
18, 780	6	2	15 3	7 6	do	6	
40, 064	6	1	15 3	7 0	do	7	
123, 948	6	3	34 3	9 2	do	7	12, Stillwater Junction to Saint Paul.
133, 964	6	3	12 0	7 6	do	7	6, Hilbert to Green Bay.
70, 738	6	2	13 3	7 3	do	7	
10, 016	6	2	13 3	7 3	do	7	
107, 672	6	3	13 2	6 9	do		6, Phillips to Ashland.
48, 202	6	3	13 10	7 8	do		6, Manitowoc to Two Rivers.
39, 438	6	3	13 10	7 8	do		12, New London to Clintonville.
48, 828	6	2	10 0	7 3	do		
55, 714	6	2	11 6	8 6	do		
24, 414	6	1	13 7	7 5	do		
123, 322	6	3	16 2	9 4	do	6	
45, 046	6	1	13 2	6 9	do		
36, 934	6	1	6 0	3 6	do		
208, 458	6	5	20 2	9 0	do	6	
135, 842	6	3	17 9	8 9	do	6	
			17 2	8 9	Night	6	6, Saint Paul to Wilmar.
47, 576	6	2	12 0	8 11	Day	6	
88, 266	6	1	9 0	7 4	do	6	
76, 372	6	2	22 6	9 4	Night	6	
67, 608	6	1	22 0	9 3	Day	6	
97, 030	6	2	22 0	8 6	do		
129, 582	6	2	23 6	9 2	do		12, Mendota to Austin; 6, Conover to Calmar.
98, 282	6	2	13 6	9 2	do		
91, 396	6	3	40 0	9 2	do	6	6, Fort Snelling to Saint Paul.
4, 382	6	2	23 6	9 2	do		12, Minneapolis to Mendota.
25, 040	6	1	12 2	9 5	do	6	6, Mendota to Saint Paul.
26, 918	6	2	15 3	7 6	do	6	
65, 730	6	2	13 3	7 4	do		
87, 014	6	2	15 3	7 6	do	6	
			20 0	9 2	do		
135, 216	6	3	22 0	9 2	do		
			13 0	8 10	Reserve		
25, 040	6	1	8 2	7 0	Day		
82, 648	6	1	22 6	9 4	Night		
39, 438	6	1	11 11	9 3	Day	6	
37, 560	6	2	20 2	9 0	do		
156, 378	6	3	26 0	9 4	do	6	6, Cedar Rapids to Cedar Falls.
61, 348	6	1	10 4	7 8	do		3, West Union to Postville.
44, 446	6	1	10 2	9 3	do		
19, 406	6	1	10 4	7 8	do		

K.—Railway post-office lines, route-agents, and mail-route messenger service in

Number of route.	Contract designation, termini of route.	Corporate title of company.	Railway mail service, designation.	Railway post-office, route-agent, or mail-route messenger.	Distance.
27005	Burlington, Council Bluffs.	Chicago, Burlington and Quincy.	Burlington and Council Bluffs.	R. A.	291
27006	Red Oak, Eastport	do	Red Oak and Eastport ..	R. A.	56
27008	Chariton, Leon	do	Chariton and Leon	M. R. M.	37
27010	Burlington, La Cede ..	Burlington and Southwestern	Burlington and La Cede	R. A.	181
	Ottumwa, Mason City ..	Central Iowa	Mason City and Ottumwa.	R. A.	172
27011	Keokuk, Burlington...	Chicago, Burlington and Quincy.	Burlington and Keokuk	R. A.	43
27012	Clinton, La Crescent Junction.	Chicago, Clinton, Dubuque and Minneapolis.	La Crosse and Dubuque	R. A.	118
27014	Davenport, Missouri River.	do	Dubuque and Clinton ..	R. A.	66
		Chicago, Rock Island and Pacific.	Chicago and Iowa City ..	R. P. O.	55
			Davenport and Council Bluffs.	R. A.	317
27015	Des Moines, Indianola Branch, Somerset Junction, Winterset.	do	Des Moines and Winterset.	R. A.	16
27016	Washington, Knoxville	do	Washington and Knoxville.	R. A.	77
27017	Wilton Junction, Leavenworth.	Chicago, Rock Island and Pacific.	Wilton Junction and Trenton.	R. A.	229
27018	Davenport, Maquoketa.	Davenport and Northwestern.	Trenton and Atchison.	R. A.	111
27019	Keokuk, Des Moines ..	Chicago, Rock Island and Pacific.	Maquoketa and Davenport.	M. R. M.	44
27020	Farley, Cedar Rapids.	Chicago, Milwaukee and Saint Paul.	Des Moines and Keokuk	R. A.	162
27021	Dubuque, Sioux City ..	Illinois Central	Farley and Cedar Rapids	R. A.	58
			Sabula and Cedar Rapids	R. A.	6
			Dubuque and Fort Dodge.	R. A.	192
			Fort Dodge and Sioux City.	R. A.	135
27022	Waterloo, Mona	do	Mona and Waterloo	R. A.	80
27024	Clinton, Anamosa	Chicago and Northwestern	Clinton and Anamosa ..	R. A.	71
27025	Calmar, Pattersonville	Chicago, Milwaukee and Saint Paul.	Calmar and Sheldon	R. A.	211
27027	Davenport, Fayette...	Davenport and Northwestern	Fayette and Davenport	R. A.	128
27028	Savannah, Marion	Chicago, Milwaukee and Saint Paul.	Sabula and Cedar Rapids	R. A.	87
27029	Missouri Valley, Sioux City.	do	Sioux City and Missouri Valley.	R. A.	76
	Branch, California Junction, Tremont.	Sioux City and Pacific...	Wisner and Blair	R. A.	6
27030	Des Moines, Callanan	Des Moines and Minneapolis	Callanan and Des Moines	R. A.	58
27031	Des Moines, Fort Dodge.	Des Moines and Fort Dodge.	Fort Dodge and Des Moines.	R. A.	87
27033	Albia, Knoxville	Chicago, Burlington and Quincy.	Knoxville and Albia ...	R. A.	33
27038	Maple River Junction, Mapleton.	Chicago and Northwestern ..	Maple River Junction and Mapleton.	R. A.	60
28022	Roadhouse, Mexico ...	Chicago and Alton	Bloomington and Mexico	R. P. O.	99
28001	Saint Louis, Atchison.	Missouri Pacific	Quincy and Saint Louis	R. A.	38
			Saint Louis and Atchison.	R. P. O.	283
					47
28002	Saint Louis, Bismarck	Saint Louis, Iron Mountain and Southern.	Saint Louis, Little Rock and Texarkana.	R. P. O.	75
			Saint Louis and Columbus.	R. A.	75
28003	Saint Louis, Vinita...	Saint Louis and San Francisco.	Saint Louis and Vinita.	R. A.	363
28004	Saint Louis, Kansas City.	Saint Louis, Kansas City and Northern.	Saint Louis, Mobile and Kansas City.	R. A.	278
28005	Quincy, Saint Joseph	Hannibal and Saint Joseph..	Quincy and Kansas City	R. P. O.	171
28008	Kansas City, Union Pacific Transfer.	Kansas City, Saint Joseph and Council Bluffs.	Cameron and Atchison.	R. A.	34
28007	Moberly, Ottumwa	Saint Louis, Kansas City and Northern.	Council Bluffs and Kansas City.	R. A.	197
			Ottumwa and Moberly ..	R. A.	121

operation in the United States on the 30th of June, 1879—Continued.

Annual miles of serv- ice.	Number of round trips with clerks or agents per week.	Number of railway post-office cars or cars in which there are mail apartments.	Dimension of cars or apart- ments.		Day or night service.	Number of round trips per week by express mail over whole route.	Number of round trips per week over portion of route, and between what points.
			Length.	Width.			
			<i>Ft. In.</i>	<i>Ft. In.</i>			
182, 166	6	2	51 0	8 6	Day	6	
31, 300	6	1	20 9	8 8	...do		
23, 162	6	1	16 7	8 10	...do		
113, 306	6	3	14 10	9 0	...do		
107, 672	6	3	22 0	9 6	...do	6	
26, 918	6	2	15 3	8 6	...do	6	
73, 868	6	2	18 4	8 10	...do		
87, 560	6	2	12 0	7 6	...do	6	
34, 430	6	2	50 0	9 6	Night		
198, 442	6	2	40 0	9 6	Day		6, Davenport to Wilton Junc- tion; 6, Iowa City to Missouri River.
10, 016	6	1	9 0	7 0	...do	6	12, Somerset Junction to In- dianola.
16, 902	6	1	9 0	7 0	...do	6	
48, 202	6	1	10 0	9 0	...do		6, Knoxville Junction to Knox- ville.
137, 720	6	2	18 6	9 6	Day	6	
81, 030	7	2	18 6	9 6	Day and night		
27, 544	6	1	11 6	6 6	...do		
101, 412	6	2	17 0	9 0	...do	6	
36, 308	6	1	10 0	9 0	...do		
3, 756	6	2	10 7	9 6	...do		
120, 192	6	3	16 9	9 0	...do	6	
84, 510	6	2	18 10	9 0	...do	6	
50, 080	6	2	16 6	8 11	...do	6	
44, 446	6	1	10 2	6 10	...do		
132, 086	6	2	19 6	9 2	...do		
80, 128	6	2	10 6	6 11	...do		
54, 462	6	2	10 7	9 6	...do		
47, 576	6	2	17 4	9 0	...do	7	
5, 008	6	2	13 5	9 0	...do		6, California to Blair.
36, 308	6	1	11 0	5 2	...do		12, Des Moines to Ames.
54, 462	6	1	16 6	7 0	...do		6, Grand Junction to Fort Dodge.
20, 658	6	1	6 9	5 11	...do		
37, 560	6	1	12 3	7 4	...do		
55, 714	6	3	25 6	8 0	Night		
23, 788	6	2	17 6	8 8	Day	6	
413, 180	14	5	50 0	9 0	Day and night		7, Kansas City to Atchison.
29, 422	6					6	6, Kansas City to Lear.
54, 750	7	5	40 0	9 0	Day and night	6	6, Saint Louis to Kirkwood.
46, 950	6	2	15 0	10 0	Day	7	6, Saint Louis to De Soto.
264, 990	7	5	21 11	7 3	Day and night		6, Pacific to Rolla.
172, 776	6	4	25 6	8 6	Day	7	6, Saint Louis to Wright City.
107, 046	6	4	38 11	9 0	...do	7	
21, 284	6		13 0	9 0	...do		
123, 322	6	3	40 0	9 0	...do	7	6, Saint Joe to Winthrop.
85, 630	7	2	21 11	7 5	Night		

K.—Railway post-office lines, route-agents, and mail-route messenger service in

Number of route.	Contract designation, terminal of route.	Corporate title of company.	Railway mail service, designation.	Railway post-office, route-agent, or mail-route messenger.	Distance.
					Miles.
28010	Kansas City, Cameron	Hannibal and Saint Joseph..	Quincy and Kansas City	R. P. O.	54
28011	Sedalia, Denison	Missouri, Kansas and Texas.	Hannibal and Denison	R. P. O.	447
28012	Saint Joseph, Lexington.	Saint Louis, Kansas City and Northern.	Sedalia and Parsons	R. A.	138
28013	Brunswick, Pattonsburg.	Brunswick and Chillicothe and Saint Louis, Council Bluffs and Omaha.	Lexington and Saint Joseph.	R. A.	77
28014	Hannibal, Sedalia	Missouri, Kansas and Texas	Brunswick and Pattonsburg.	R. A.	80
28015	Keokuk, Centreville ..	Missouri, Iowa and Nebraska	Hannibal and Denison..	R. P. O.	142
28017	Sedalia, Lexington ..	Missouri Pacific	Keokuk and Centreville	R. A.	83
28018	Keokuk, Clarksville ..	Saint Louis, Keokuk and Northwestern.	Sedalia and Lexington	R. A.	38
28019	Quincy, Novinger	Quincy, Missouri and Pacific	Keokuk and Louisiana.	R. A.	86
28020	Pierce City, Oswego ..	Missouri and Western	Quincy and Kirkeville ..	R. A.	71
28021	Mexico, Cedar City ..	Chicago and Alton	Pierce City and Oswego	R. A.	73
28022	Roodhouse, Mexico	do	Mexico and Jefferson City.	R. A.	50
28023	Cuba, Salem	Saint Louis, Salem and Little Rock.	Bloomington and Mexico	R. P. O.	90
28024	Holden, Paola	Missouri, Kansas and Texas	Cuba and Salem	M. R. M.	40
28026	Bismarck, Texarkana.	Saint Louis, Iron Mountain and Southern.	Holden and Paola	R. A.	55
28027	Cairo, Poplar Bluff ..	Kansas City, Saint Joseph and Council Bluffs.	Saint Louis, Little Rock and Texarkana.	R. P. O.	414
28028	Saint Joseph, Hopkins.	Saint Louis, Hannibal and Keokuk.	Cairo and Poplar Bluff	R. A.	73
28029	Hannibal, Prairieville.	Hannibal and Saint Joseph Wyandotte, Kansas City and Northwestern.	Creston and Saint Joseph.	R. A.	61
28030	Saint Joseph, Atchison	Saint Louis, Hannibal and Keokuk.	Hannibal and Prairieville.	M. R. M.	47
28033	Kansas City, Lexington.	Hannibal and Saint Joseph	Cameron and Atchison	R. A.	42
28034	Bismarck, Columbus..	Wyandotte, Kansas City and Northwestern.	Lexington and Kansas City.	R. A.	43
29001	Hopfield, Little Rock	Saint Louis, Iron Mountain and Southern.	Saint Louis and Columbus.	R. A.	120
29002	Helena, Clarendon	Memphis and Little Rock...	Memphis and Little Rock.	R. A.	134
29003	Argenta, Fort Smith ..	Arkansas Central	Helena and Clarendon ..	R. A.	48
29004	Pine Bluff, Collins	Little Rock and Fort Smith.	Little Rock and Fort Smith.	R. A.	100
30001	New Orleans, Canton ..	Little Rock, Mississippi River and Texas.	Pine Bluff and Collins..	R. A.	100
30002	New Orleans, Donaldsonville.	Chicago, Saint Louis and New Orleans.	Cairo and New Orleans.	R. P. O.	206
30003	New Orleans, Morgan City.	New Orleans and Texas.....	New Orleans and Donaldsonville.	R. A.	84
30006	Vicksburg, Monroe ...	Morgan's Louisiana and Texas.	New Orleans and Texas	R. A.	83
31001	Houston, Galveston...	Vicksburg, Shreveport and Texas.	Vicksburg and Monroe	M. R. M.	75
31002	Houston, San Antonio	Galveston, Houston and Henderson.	Houston and Galveston	R. A.	51
31003	Houston, Denison	Galveston, Harrisburgh and San Antonio.	Houston and San Antonio.	R. A.	214
31004	Hempstead, Austin	Houston and Texas Central.	Denison and Houston ..	R. A.	237
31005	Bremond, Waco	do	Hempstead and Austin	R. A.	118
31006	Longview, Houston ..	do	Bremond and Waco	R. A.	44
	Branch, Mineola, Troup.	International and Great Northern.	Longview and Houston	R. A.	226
31007	Palestine, Austin	do	Mineola and Troup	R. A.	44
31008	{Shreveport, Fort Worth.	do	Palestine and Austin	R. A.	183
	{do	Texas Pacific	{Shreveport and Marshall.	R. A.	40
31010	Marshall, Texarkana..	do	Texarkana and Fort Worth.	R. A.	179
			do	R. A.	7

operation in the United States on the 30th of June, 1879—Continued.

Annual miles of serv- ice.	Number of round trips with clerks or agents per week.	Number of railway post-office cars or cars in which there are mail apartments.	Dimension of cars or apart- ments.		Day or night services.	Number of round trips per week by express mail over whole route.	Number of round trips per week over portion of route, and between what points.
			Length.	Width.			
			<i>Ft. In.</i>	<i>Ft. In.</i>			
32,552	6	4	33 11	9 0	Day	7	5, Parsons to Denison.
326,810	7	5	50 0	9 0	Day and night		
99,534	6	2	16 8	9 2	Day		
48,202	6	2	19 5	7 5	do		
50,080	6	1	8 2	6 10	do		6, Brunswick to Chillicothe.
103,600	7		50 0	9 0	do	5	
53,210	6	2	12 9	8 10	do		
35,056	6	1	8 0	6 8	do	1	
53,836	6	2	18 0	8 11	do	6	6, Louisiana to Clarksville.
44,446	6	1	11 0	4 7	do		6, Kirksville to Novinger.
53,290	7		12 8	6 10	do		7, Carthage to Oronogo.
31,300	6	1	17 0	6 9	do		
12,520	8	1	11 6	6 6	Day		See 28022, above.
34,430	6	1	13 3	7 3	do		
302,220	7		40 0	9 0	Day and night		
45,698	6	1	13 6	6 8	do	1	
38,186	6		15 3	7 4	Day	6	
	6	In baggage car.		do			
13,772	6		13 0	9 0	do	7	
26,292	6	1	8 0	5 1	do		
75,120	6	1	15 0	10 0	do	7	
97,820	7	2	23 0	8 6	Day and night		
30,048	6	1	9 4	6 5	Day		
105,794	6	2	12 3	7 3	do		
31,300	8	1	6 9	2 9	do		
150,380	7	(*)			do		
40,064	6	1	9 0	6 6	Day		
		1	11 0	7 6	Reserve		
60,560	7	1	10 6	6 6	Day		
		1	9 4	6 4	do		
		1	15 4	6 6	do		
		1	9 0	6 4	Reserve		
		1	15 4	6 6	do		
54,750	7	1	11 0	7 0	Day		
		1	8 6	7 1	do		
		1	8 0	7 0	Reserve		
69,156	13		15 2	6 10	Day and night		
156,220	6		12 0	9 0	Day	6	
246,010	7		18 0	9 3	Day and night	6	
73,868	6		14 8	9 1	Day		
27,544	6	1	11 6	9 0	do	7	
172,280	7		14 0	7 9	Day and night		
27,544	6		7 8	7 2	do		
133,590	7		18 0	7 2	do		
25,040	6		13 10	7 8	Day		
130,670	7		16 10	7 6	Day and night		
54,020	7		16 10	7 6	do		

* See No. 18001.

K.—Railway post-office lines, route-agents, and mail-route messenger service in

Number of route.	Contract designation, termini of route.	Corporate title of company.	Railway mail service, designation.	Railway post-office, route-agent, or mail-route messenger.	Distance.
					Miles.
31011	Sherman, Texarkana..	Texas Pacific.....	Texarkana and Sherman.	R. A.	134
31012	Houston, Orange.....	Texas and New Orleans.	Houston and Orange...	R. A.	106
31013	Jefferson, Sulphur Springs.	East Line and Red River....	Jefferson and Sulphur Springs.	M. R. M. ...	93
33001	Kansas City, Denver..	Kansas Pacific.....	Kansas City and Denver.	R. A.	658
33002	Lawrence, Leavenworth.	.....do	Leavenworth and Burlington.	R. A.	32
33003	Atchison, Waterville.	Central Branch Union Pacific.	Atchison and Cawker City.	R. A.	161
33004	Lawrence, Coffeyville.	Kansas City, Lawrence and Southern.	Leavenworth and Burlington.	R. A.	27
		.....do	Kansas City and Independence.	R. A.	97
33005	Cherry Vale, Independence.	.....do .....	.....do	R. A.	10
33006	Kansas City, Ottawa..	.....do .....	.....do	R. A.	54
33007	Elwood, Hastings.....	Saint Joseph and Denver City.	Saint Joseph and Hastings.	R. A.	27
33008	Kansas City, Baxter Springs.	Kansas City, Fort Scott and Gulf.	Kansas City and Baxter Springs.	R. A.	169
33009	Junction City, Parsons	Missouri, Kansas and Texas.	Junction City and Parsons.	R. A.	156
33010	Atchison, Pueblo.....	{ Atchison, Topeka and Santa Fé. }	{ Atchison and Wichita } Newton and Pueblo. }	R. A.	618
33011	Newton, Wichita.....	.....do	Atchison and Wichita.	R. A.	27
33012	Atchison, Lincoln.....	Atchison and Nebraska.....	Lincoln and Atchison.	R. A.	152
33013	Leavenworth, Onaga..	Kansas Central	Leavenworth and Onaga.	R. A.	84
33015	Junction City, Clyde..	Junction City and Fort Kearney.	Clyde and Junction City.	R. A.	55
33016	Topeka, Kansas City..	Atchison, Topeka and Santa Fé.	Kansas City and Topeka.	R. A.	66
33017	Florence, Eldorado...	Florence, Eldorado and Walnut Valley.	Florence and Eldorado.	M. R. M. ...	30
33019	Ottawa, Burlington...	Kansas City, Burlington and Santa Fé.	Leavenworth and Burlington.	R. A.	46
33020	Girard, Joplin City...	Joplin	Girard and Joplin.....	M. R. M. ...	34
33021	Waterville, Washington.	Waterville and Washington.	Atchison and Cawker City.	R. A.	13
33022	Greenleaf, Concordia..	Republican Valley.....	Atchison and Cawker City.	R. A.	43
33024	Parsons, Messer.....	Memphis, Kansas & Colorado	Messer and Parsons....	M. R. M. ...	43
33026	Concordia, Cawker City.	Atchison, Solomon Valley and Denver.	Atchison and Cawker City.	R. A.	49
34001	Council Bluffs, Ogden.	Union Pacific.....	Omaha and Ogden.....	R. P. O. ...	1,034
34002	Plattsmouth, Kearney	Burlington and Missouri River in Nebraska.	Omaha and Bloomington.	R. A.	190
34003	Omaha, Tekamah.....	Omaha and Northwestern.	Tekamah and Omaha..	R. A.	47
34004	Omaha, Orepolls.....	Burlington and Missouri River in Nebraska.	Omaha and Bloomington.	R. A.	17
34005	Nemaha City, York....	.....do	York and Nemaha City.	R. A.	136
34006	Crete, Beatrice.....	.....do	Crete and Beatrice....	M. R. M. ...	20
34008	Valley, Rising City...	Omaha and Republican Valley.	Valley and Rising City.	R. A.	71
34009	Hastings, Bloomington	Burlington and Missouri River in Nebraska.	Omaha and Bloomington.	R. A.	70
34010	Fremont, Wisner.....	Sioux City and Pacific.....	Wisner and Blair.....	R. A.	51
35001	Sioux City, Yankton..	Dakota Southern	Sioux City and Yankton.	R. A.	61
38001	Denver, El Moro.....	Denver and Rio Grande....	Denver and Alamosa...	R. A.	170
	Branch, Pueblo, Cañon City.	.....do	Pueblo and Cañon City.	R. A.	40
38003	Denver, Colorado Junction.	Union Pacific (Colorado division).	Cheyenne, Boulder and Denver.	R. A.	131
	Branch, Golden, Georgetown.	.....do	Golden and Georgetown.	R. A.	35
38004	Cucharas, La Veta....	Denver and Rio Grande....	Denver and Alamosa..	R. A.	22
38005	Denver, Webster.....	Denver and South Park and Pacific.	Denver and Webster..	R. A.	70

operation in the United States on the 30th of June, 1879—Continued.

Annual miles of service.	Number of round trips with clerks or agents per week.	Number of railway post-office cars or cars in which there are mail apartments.	Dimension of cars or apartments.		Day or night service.	Number of round trips per week by express mail over whole route.	Number of round trips per week over portion of route, and between what points.
			Length.	Width.			
82,884	6	.....	<i>Ft. In.</i> 13 4	<i>Ft. In.</i> 7 8	Day and night.	.....
66,256	6	.....	10 0	7 9	Day	.....
58,218	6	.....	9 6	6 6	do	.....
465,740	7	8	30 0	9 6	Day and night	.....	6, Kansas City to Ellia.
20,658	6	.....	18 0	8 6	Day	.....
63,226	6	.....	14 0	7 6	do	.....
16,902	6	.....	18 2	8 7	do	.....	6, Cherry Vale to Coffeyville.
60,722	6	.....	18 2	8 7	do	.....
6,260	6	.....	18 2	8 7	do	.....
33,804	6	.....	18 2	8 7	do	.....
142,102	6	8	12 0	7 3	do	.....
100,160	6	.....	18 1	8 7	do	.....	7, Kansas City to Fort Scott.
97,656	6	2	15 1	7 4	do	.....
451,140	7	.....	23 2	9 4	Day and night.	.....	6, Topeka to Dodge City.
19,710	7	.....	14 0	8 0	Day	.....	6, Newton to Wlchita.
95,152	6	.....	10 9	9 2	do	.....
52,584	6	1	7 2	4 8	do	.....
34,430	6	1	10 0	7 10	do	.....
49,640	7	.....	13 0	8 6	do	.....
18,780	6	1	13 6	9 3	do	.....
28,796	6	.....	18 2	8 7	do	.....
21,284	6	.....	14 0	7 6	Day	.....
8,138	6	.....	14 0	7 6	do	.....
26,292	6	.....	14 0	7 6	do	.....
26,918	6	1	10 0	6 0	do	.....
30,674	6	.....	14 0	7 6	do	.....
754,620	7	10	47 6	9 0	do	.....
118,940	6	3	18 5	8 10	do	.....
29,422	6	1	9 6	7 6	do	.....
10,642	6	3	18 5	8 10	do	.....	6.
85,136	6	2	9 6	6 8	do	.....
18,780	6	1	5 0	3 0	do	.....
44,446	6	2	10 0	8 0	do	.....
43,820	6	2	18 5	8 10	do	.....
31,926	6	2	13 5	9 0	do	.....
38,186	6	1	16 9	9 6	do	.....
124,100	7	2	17 9	7 4	do	.....	7, Cuscharas to El Moro.
29,200	7	1	12 4	6 5	do	.....
95,630	7	2	.....	.....	do	.....	6, Denver to Boulder.
25,550	7	.....	.....	.....	do	.....
16,060	7	.....	17 9	7 4	do	.....
51,100	7	.....	.....	.....	do	.....	6, Denver to Bear Creek Junction.

K.—*Railway post-office lines, route-agents, and mail-route messenger service is*

Number of route.	Contract designation, termini of route.	Corporate title of company.	Railway mail service, designation.	Railway post-offices, route-agent, or mail-route messenger	Miles
					Dist.
38007	Denver, Cheyenne	Denver Pacific.....	Cheyenne, Hughes and Denver.	R. A.	106
41001	Salt Lake City, Ogden.	Utah Central	Ogden and Salt Lake ..	R. A.	37
41002	Salt Lake City, York.	Utah Southern	Salt Lake and York.....	R. A.	75
41003	Ogden, Franklin	Utah and Northern	Franklin and Ogden	M. R. M.	90
43001	Kalama, Wilkerson	Northern Pacific	Tacoma and Portland ..	R. A.	165
44001	Portland, Roseburg	Oregon and California	Portland and Roseburg ..	R. A.	200
44002	Portland, Saint Joseph	Oregon Central	Portland and Saint Joseph.	R. A.	40
45001	Virginia City, Reno....	Virginia and Truckee	Reno and Virginia City ..	R. A.	52
46001	San Francisco, Ogden ..	Central Pacific.....	Ogden and San Francisco.	R. P. O.	885
46002	San Francisco, Soledad	Southern Pacific	San Francisco and Soledad.	R. A.	143
46003	Roseville, Redding....	California and Oregon	Redding and Sacramento.	R. A.	170
46006	Sacramento, San Francisco.	California Pacific	Sacramento and San Francisco.	R. A.	84
46008	Napa Junction, Calistoga.	.....do	Calistoga and San Francisco.	R. A.	60
46010	Lathrop, Goshen	Central Pacific.....	Lathrop and Los Angeles.	R. A.	482
46014	Huron, Yuma	Southern Pacific.....			
46011	San Francisco, Cloverdale.	San Francisco and Northern Pacific.	Cloverdale and San Francisco.	R. A.	80
46012	Stockton, Milton	Stockton and Copperopolis..	Milton and Stockton ..	M. R. M.	30
46014	Huron, Yuma.....	Southern Pacific.....	Yuma and Los Angeles ..	R. A.	249
46016	San Francisco, Duncan Mills.	North Pacific Coast	Duncan Mills and San Francisco.	M. R. M.	80
46017	Los Angeles, Santa Ana.	Southern Pacific.....	Los Angeles and Santa Ana.	M. R. M.	34
46022	Woodland, Willows....	Northern	Willows and Woodland ..	R. A.	65
46026	San Francisco, Alameda.	Central Pacific.....	Alameda and San Francisco.	R. A.	13
46028	San Francisco, Tracy ..	.....do	Tracy and San Francisco.	R. A.	71
			Total annual miles..		

operation in the United States on the 30th of June, 1879—Continued.

Annual miles of service.	Number of round trips with clerks or agents per week.	Number of railway post-office cars or cars in which there are mail apartments.	Dimension of cars or apartments.		Day or night service.	Number of round trips per week by express mail over whole route.	Number of round trips per week over portion of route, and between what points.
			Length.	Width.			
77,380	7	2	<i>Ft. In.</i> 12 0	<i>Ft. In.</i> 7 0	Day		7, Denver to Hughes.
54,020	14	1	14 2	8 8	...do		
54,750	7	2	15 0	9 0	...do		
58,400	7	2	15 0	6 11	...do		
65,730	6	2	9 0	7 6	...do		
125,200	6	2	22 6	9 0	...do		
30,048	6	1	9 6	7 0	...do		
37,960	7	1	12 0	9 0	Night		6, Sacramento to Reno.
653,350	7	7	55 2	9 6	Day and night		7, San Francisco to Stockton.
104,890	7	2	17 0	9 0	Day		6, San Francisco to San José.
124,100	7	1	17 0	9 0	Reserve		6, San Francisco to Pajaro.
			23 6	8 10	Day and night		6, Sacramento to Marysville.
62,780	7	1	10 0	8 10	Day	6	6, Sacramento to Davisville.
42,568	6	1	10 0	8 10	...do		
351,860	7	2	23 6	8 10	Day and night		
		2	31 6	8 11	...do		
		1	31 6	8 11	Reserve		
56,340	6	1	12 3	8 11	Day	1	6, San Francisco to Santa Rosa.
18,780	6	1	10 0	8 9	...do		6, Stockton to Peter's.
181,770	7	2	11 9	8 5	Day and night		
		1	24 7	8 10	...do		
18,780	6	2	8 0	6 0	Day		6, San Francisco to San Rafael.
24,820	7	1	8 4	6 11	...do		
40,690	6	1	8 9	7 4	Day and night		
35,256	26	3	10 8	9 1	Day		
51,630	7	1	10 0	8 9	...do		
52,419,773							

REPORT

OF THE

SUPERINTENDENT OF RAILWAY MAIL SERVICE.



REPORT

OF THE

SUPERINTENDENT OF RAILWAY MAIL SERVICE.

POST-OFFICE DEPARTMENT,
OFFICE GENERAL SUPERINTENDENT
RAILWAY MAIL SERVICE,
Washington, D. C., November 1, 1879.

SIR : The appropriation for

RAILWAY POST-OFFICE CLERKS

for the fiscal year ending June 30, 1880, is \$1,350,000.

From the tables accompanying these estimates the increase and decrease in the force and expenditures for the various years will be seen, as also the large increase in the mails now passing over the various railroads, and the large increase in the proportion of the same handled on the postal cars.

The registration of third-class mail has largely increased the work on the postal cars, and, in my opinion, there should be placed on all the great through post-office lines clerks whose only duty should be to receive, receipt for, and take sole charge of the registered mail. This class of mail-matter is growing rapidly and it is an important part of the service. The value and importance of this mail demand that on the great lines one clerk should be assigned to its care and safety. It is too much to require a clerk to do full distribution, then impose on him a further duty of taking the charge and responsibility of the registered mail, where he must receipt for each package, enter it in his register-book, and obtain in turn a receipt for it; this is no small amount of work to say nothing of the great responsibility.

I desire to call attention to the fact that the railway post-office lines from Danville, Va., to New Orleans, La. (double daily); Petersburg, Va., to Savannah, Ga. (double daily); Savannah, Ga., to Jacksonville, Fla. (single daily); Kansas City, Mo., to Pueblo, Colo. (single daily); Saint Louis, Mo., to Texarkana, Texas (single daily); and the La Fayette, Ind., and Saint Louis, Mo. (single daily), are only provided with route-agents to perform the railway post-office service on the above-named lines. So long as the four classes of employés are retained, the appropriation should be made so that it will not be necessary to assign route-agents exclusively to railway post-office work.

When the estimates for the present fiscal year were made, the above-named lines, excepting the Saint Louis and Texarkana railway post-office, were not in operation, consequently no provision was made in the last appropriation for this additional service, yet it was thought advisable to establish the service at that time on the best footing possible and bring the matter to the attention of Congress.

Railway post-office clerks were not appointed on these lines, but the route-agents that were on the lines at the time of the establishment of the railway post-office service were retained as such, and a few more appointed; at the same time there is still a lack of force to properly perform the necessary requirements of the service.

I desire also to call attention to the fact that there have been very few promotions made during the past fiscal year, nor can there be with the present appropriation for this fiscal year. There are a great number of very worthy, competent, and deserving men that should be promoted, and I would therefore, in view of these facts, respectfully recommend that you ask for an appropriation of \$1,450,000 for the fiscal year ending June 30, 1881.

ROUTE-AGENTS.

The appropriation for route-agents for the fiscal year ending June 30, 1880, is \$1,125,000. Section 4024 of the Revised Statutes provides that the Postmaster-General may employ route-agents at a salary of not less than nine hundred nor more than twelve hundred dollars per annum. Heretofore the pay of these agents has been graded according to the average number of miles run daily, but during the past year it became an absolute necessity to reduce nearly all of them to the minimum under the law, to prevent there being a deficiency in the appropriation. This reduction was a great injustice to the route-agents, many of whom are assigned to duty on railway post-office lines to perform the way or local work, and quite a number actually perform or make the same distribution as railway post office clerks. It was also great injustice to the agents that run on the larger route-agent lines, where there is a large amount of work to perform. These agents are required to, and cheerfully perform their work in such a manner that all way and through connections are made, thus giving the mail practically the same rapidity in transit as a passenger could attain.

There is a growing need and a pressing demand for double daily route-agent service on the more important lines of that class. Having given this matter mature consideration, I have to respectfully recommend that you ask for an appropriation of \$1,225,000 for the fiscal year ending June 30, 1881.

MAIL-ROUTE MESSENGERS.

The appropriation for mail-route messengers for the present fiscal year is \$175,000. This amount is not sufficient to meet the demands of the service. Railroads are being built in all parts of the country, and the mileage is increasing more rapidly than was anticipated, and in view of the increasing prosperity of the country will doubtless continue to gain in a much larger ratio in the immediate future.

Where there is a railroad in operation the public very properly demand that it shall have the benefits of an agent upon it, if not more than thirty or forty miles in length. Railroad service without an agent is not as good for the general public on its line as star service. The first agents appointed on a new road are almost invariably mail-route messengers, which increases the demands on this appropriation. It is respectfully recommended that you ask for an appropriation of \$200,000 for the fiscal year ending June 30, 1881.

LOCAL MAIL-AGENTS.

The appropriation for local mail-agents for the present fiscal year is \$120,000. There is great need for an increase in this appropriation.

These agents are now required to receipt for and transfer registered mail in addition to their other duties, which greatly increases their work, and requires them to assume a heavy responsibility, for which a large percentage of them do not receive an adequate remuneration for the labor performed. There are many railroad junctions which the good of the service demands should be provided with local agents.

There is no branch of the service more important than this, yet its merits have in a measure been overlooked. It neutralizes the good effects of close distribution if the transfers are not made at railroad junctions promptly and with dispatch, and there is no certainty that this will be done unless there is some one to attend to it who is only responsible to the department. If the transfer is intrusted to railroad employes it very frequently happens that the connection is missed, this being to them a secondary consideration, and for the performance of which they think they receive no pecuniary compensation.

I have carefully examined the requirements of this service and respectfully recommend that you ask for an appropriation of \$150,000 for the fiscal year ending June 30, 1881.

SALARIES OF EMPLOYÉS OF THE RAILWAY MAIL SERVICE.

I desire to call attention to my predecessor's last annual report on this subject. Experience has taught me that his recommendation was a good one, and I fully indorse and earnestly recommend its adoption :

"In my last annual report I called attention to the present salaries of the employes of this service.

"If this salary represented the net amount received by these employes it might then be considered fair; but it does not; for out of this must come their expenses when absent from home attending to their duties. In this expense there is no uniformity. His absence and consequently his expense depend on the importance of the route, the length of the run, the schedule, &c. The more important and heavier the route and the work, the longer time the employé has to absent himself, and the less opportunity he has to take advantage of any little circumstance which would inure to his pecuniary benefit. The more he has the interest of the service at heart, the greater the sacrifice he is called upon to make for its benefit.

"In fact, the success and growth of this service and the efficiency it has attained have been secured almost entirely by the efforts of those holding subordinate positions, who have, with comparatively small salaries, devoted their time and energies to it, changing from one place to another as their services were demanded, filling in where the exigencies of the service required regardless of the sacrifices they were called on to make, and which could not be compensated for except by such occasional promotion as it has been possible to make. While some have received their hard-earned and merited promotion, there are still many who cannot, under the present organization, have their services thus recognized.

"In the present organization, one general superintendent, two assistant superintendents, and nine division superintendents are expected to keep the system in perfect running order on 95,000 miles of railroad and steam-boat routes, over which there is performed nearly 100,000,000 miles of annual service, superintend and regulate the workings of 2,605 employes on these routes, regulate and correct the distribution at all post-offices. How this has been done can best be judged from the report of mails distributed and errors made.

"In this connection, it should be remembered that at least twice in each year there is a general change in the railroad schedules, and many less important ones each month, all of which must be anticipated, and the effect of each on the forwarding of the mails provided for.

"CHIEF HEAD CLERKS.

"After all these changes in distribution and other information has been tabulated and put in convenient form for reference by the employés on the line, it has been necessary to detail employés to examine the clerks, to see that they keep informed of all these changes, and that the duty assigned to them is properly performed; in other words, to superintend the work on each particular route or group of routes. To do this, it is necessary that he travel constantly, and for this the utmost that can be paid is \$1,400 per annum, out of which all his traveling-expenses must come. It does seem that to provide for this, a grade of officers, to be styled chief head clerks, should be established, with pay not to exceed \$1,400 per annum and actual traveling-expenses not exceeding \$3 per day.

"CLASSIFICATION.

"The question of a change in the classification was discussed last year.

"Now that the service is brought under one general management, and each employé is required to work under the same general instructions and schemes, the only distinction in fact being the quantity of work, it seems that distinctions obsolete in practice should be abandoned. The clerks could be more uniformly graded, avoiding the dissatisfaction that now arises from the distinction in designation and pay where there is none in the work. It would, therefore, be better for the service, and prove more economical, should the appropriation be made in gross for these five classes, designating them as postal clerks, and allowing, say, five classes," whose salaries shall not exceed the following rates per annum: First class, \$800; second class, \$900; third class, \$1,000; fourth class, \$1,200, and fifth class, \$1,400. If this recommendation is adopted the first, second, and third classes would be employed on the lighter and shorter lines. The fourth and fifth classes where railway post-office cars are required. The reclassification and making the appropriation in gross will in no way increase the expenditure. In the event of the adoption by Congress of this classification, the appropriation for railway postal clerks should be \$3,025,000.

The accompanying Tables A and B are an exhibit of the increase and decrease of this branch of the postal service.

TABLE A.—Statement for the years 1870 to 1879, inclusive, showing the number of railway post-offices clerks, route-agents, mail-route messengers, and local agents employed, amount of annual compensation to each class, and the percentage of increase and decrease in number and annual compensation.

Year.	Number of railway post-office clerks in service at end of each fiscal year.	Increase in railway post-office clerks.	Increase, per cent.	Annual compensation.	Increase of annual compensation.	Decrease of annual compensation.	Increase per cent. of annual compensation.	Decrease per cent. of annual compensation.	Number of route-agents in service at end of each fiscal year.	Increase in route-agents.	Decrease in route-agents.	Increase, per cent.	Decrease, per cent.	Annual compensation.	Increase of annual compensation.	Decrease of annual compensation.	Decrease, per cent.	Increase, per cent.	Decrease of annual compensation.	Increase, per cent.	Decrease, per cent.
1870.	375	...	...	\$442,600 00	...	...	...	...	587	...	...	10.52	...	\$374,600 00	...	...	...	...	...	...	...
1871.	513	138	36.8	649,400 00	206,800 00	46.72	72.5	...	684	97	...	11.69	...	577,820 00	203,220 00	35.35	5.8	19.83	...	...	...
1872.	642	129	25.15	821,600 00	172,200 00	26.33	36.2	...	764	80	...	12.83	...	737,820 00	165,220 00	22.40	2.7	9.91	...	...	...
1873.	752	110	17.13	941,000 00	119,400 00	12.68	16.5	...	862	98	...	8.58	...	828,240 00	86,440 00	10.32	1.1	12.25	...	...	...
1874.	850	98	13.03	1,058,200 00	117,200 00	11.12	12.8	...	936	74	...	9.45	...	896,680 00	78,440 00	8.72	0.9	8.26	...	...	...
1875.	901	51	6.00	1,163,600 00	105,400 00	9.06	7.8	...	987	51	...	2.85	...	896,390 52	70,010 00	7.80	0.8	...	...	...	...
1876.	1,042	141	15.65	1,223,750 19	60,150 03	4.91	5.2	...	1,017	30	...	2.95	...	940,151 97	43,761 45	4.65	0.5	4.88	...	...	...
1877.	1,031	9	0.86	1,223,569 41	...	...	...	...	1,065	48	...	4.72	...	956,660 86	19,508 86	2.07	0.2	2.07	...	...	...
1878.	1,081	30	2.85	1,238,292 71	14,723 30	1.20	0.9	...	1,143	78	...	7.32	...	983,811 51	34,150 65	3.45	0.3	3.55	...	...	...
1879.	1,091	10	0.82	1,341,384 14	103,101 43	8.32	6.3	...	1,133	...	10	...	...	1,035,891 91	42,050 40	4.02	0.4	4.23	...	...	...

Year.	Increase in mail-route messengers.	Decrease in mail-route messengers.	Increase, per cent.	Decrease, per cent.	Annual compensation.	Increase of annual compensation.	Decrease of annual compensation.	Increase, per cent.	Decrease, per cent.	Number of local mail-agents in service at end of each fiscal year.	Increase in local mail-agents.	Decrease in local mail-agents.	Increase, per cent.	Decrease, per cent.	Annual compensation.	Increase of annual compensation.	Decrease of annual compensation.	Increase, per cent.	Decrease, per cent.	Decrease of annual compensation.	Increase, per cent.
1870.	...	...	...	...	\$45,710 00	...	...	...	...	66	...	...	...	...	...	...	...	...	...	...	...
1871.	25	...	32.05	...	61,910 00	16,200 00	35.44	...	...	82	16	...	24.24	...	58,430 00	...	...	24.39	...	...	...
1872.	43	...	41.75	...	86,910 00	25,000 00	43.23	...	...	95	13	...	15.85	...	69,216 00	10,786 00	15.46	18.46	...	...	...
1873.	25	...	17.12	...	106,740 00	16,830 00	18.72	...	...	110	15	...	15.70	...	82,596 00	13,680 00	16.78	19.78	...	...	...
1874.	40	...	23.39	...	136,540 00	29,800 00	27.82	...	...	124	14	...	12.73	...	94,710 00	11,814 00	12.45	14.25	...	...	...
1875.	14	...	6.64	...	139,999 35	...	...	...	...	125	1	...	0.80	...	86,980 70	...	...	...	...	...	...
1876.	...	6	2.67	...	147,132 27	17,132 92	13.19	...	...	136	12	...	9.6	...	101,813 27	11,832 57	11.62	13.15	...	...	...
1877.	29	...	13.24	...	147,598 61	446 34	0.30	...	...	136	...	...	...	...	105,718 70	8,905 43	8.33	8.83	...	...	...
1878.	...	7	2.82	...	154,375 54	6,776 93	4.52	...	...	134	7	...	5.14	...	109,041 64	3,322 91	3.02	3.14	...	...	...
1879.	6	...	2.49	...	171,241 32	16,866 78	10.02	...	...	134	...	...	...	...	116,177 88	7,136 24	6.14	6.54	...	...	...

The increase in the miles of railroad routes in operation June 30, 1879, over that in operation June 30, 1878, was 3.72 per cent.; the increase in miles of annual service performed over the same was 1.06 per cent.; the increase in the total miles of railroad and steamboat routes was 6.34 per cent.; the increase in miles of annual service performed over the same was 1.48 per cent.

The miles of route on which there were railway post-offices was increased 2.12 per cent., while the annual service performed on these routes was decreased 00.37 per cent. This decrease is more apparent than real, as it arises from corrections in the length and frequency of service on routes.

EXTENSION OF POSTAL-CAR SERVICE IN THE SOUTH.

During the past fiscal year the Washington, D. C., and Lynchburgh, Va., railway post-office was extended to Danville, Va., and a second daily line established, making double daily service between Washington, D. C., and Danville, Va. There was a pressing need for this service, and it has proved of great benefit to the public on that line. To make this line of more importance the second daily line should be established between Lynchburgh, Va., and Chattanooga, Tenn. The line passes through a rich, populous section that demands and ought to have this increased service. Efforts have been made to secure such additional service, but thus far all our exertions have been unsuccessful; but I still have hopes that in the near future such service may be secured.

There was one line of forty-foot postal cars running on the New York and Chicago Railway post-office, which were found inadequate for the service to be performed. These have been substituted with sixty-foot cars, which greatly facilitates the work of distribution to be made between the two important commercial centers of New York and Chicago.

During the past fiscal year arrangements were made to establish single daily railway post-office service between Richmond and Danville, Va., and double daily service between Danville, Va., and New Orleans, La., via Charlotte, Atlanta, Montgomery, and Mobile; double daily service between Petersburg, Va., and Savannah, Ga.; single daily service between Savannah, Ga., and Jacksonville, Fla.; single daily between Kansas City, Mo., and Pueblo, Colo. There was no provision made in the last appropriation to pay these employes, yet the special fund placed at the disposal of the Postmaster-General enabled him to procure this service, and it was thought best to secure it when it could be obtained. The special fund placed at the disposal of the Postmaster-General has proved to be of incalculable benefit to the service, and enabled him to continue harmonious relations with the railroad companies, and secure the additional facilities with greatly improved schedules. It is hoped that Congress will make some provision so that the present facilities may be continued.

MAIL DISTRIBUTED, ERRORS MADE, ETC.

Particular attention is called to the statement of error-slips, mail distributed, &c., Tables C and D, attached hereto.

TABLE C.—Statement of mail distributed on the various railway post-office lines of the railway mail-service during the fiscal year ending June 30, 1879.

Division.	Number of letter-packages distributed.	Whole number of letters distributed.	Number of sacks of paper-mail distributed.	Whole number of pieces of paper-mail distributed.	Whole number of letters and pieces of paper-mail distributed.	Number of packages, pouches, and sacks of registered mail matter.
First	2, 934, 159	146, 707, 950	369, 351	73, 870, 200	220, 578, 150	815, 656
Second	4, 447, 438	222, 371, 900	664, 064	132, 938, 800	355, 310, 700	1, 607, 589
Third	1, 172, 660	58, 633, 000	193, 461	38, 692, 200	97, 325, 200	534, 283
Fourth*	1, 213, 818	60, 680, 900	258, 648	51, 929, 800	112, 620, 700	1, 061, 172
Fifth	5, 948, 000	297, 400, 000	1, 035, 620	207, 124, 000	504, 524, 000	1, 644, 682
Sixth	8, 475, 047	423, 752, 350	1, 043, 663	208, 732, 000	632, 484, 950	2, 243, 274
Seventh	3, 691, 630	184, 581, 500	597, 316	119, 463, 200	304, 044, 700	1, 276, 633
Eighth	1, 016, 281	50, 814, 050	160, 387	32, 077, 400	82, 891, 450	307, 636
Ninth	4, 480, 602	224, 030, 100	574, 258	114, 851, 600	338, 881, 700	800, 685
Total	33, 379, 635	1, 668, 981, 750	4, 898, 399	979, 679, 800	2, 648, 661, 350	10, 393, 980

* The decrease in mail distributed in the fourth division during the fiscal year is due to the yellow-fever epidemic during the summer and fall months of 1878.

TABLE D.—Statement of errors made by railway post-office clerks and route-agents in the several divisions of the railway mail-service during the fiscal year ending June 30, 1879.

Division.	Number of incorrect alips returned.	Number of errors on incorrect alips.	Missent.			Misdirected.			Number of errors checked against other employes.
			Number of packages.	Number of pouches.	Number of sacks.	Number of packages.	Number of pouches.	Number of sacks.	
First	14, 760	24, 554	953	71	39	21	15	11	28, 761
Second	83, 234	62, 219	376	38	66	110	4	20	124, 013
Third	13, 757	22, 862	289	4	10	31	2	10	47, 286
Fourth	16, 425	24, 599	463	57	86	117	24	17	85, 148
Fifth	115, 538	219, 723	1, 260	114	87	347	43	198	424, 129
Sixth	88, 847	145, 334	1, 555	133	90	329	46	136	355, 797
Seventh	68, 889	110, 914	1, 242	123	147	104	4	15	228, 214
Eighth	2, 882	3, 994	95	1	-----	34	2	-----	17, 871
Ninth	73, 323	149, 312	791	81	19	16	9	32	126, 146
	427, 655	763, 511	7, 024	571	494	1, 109	149	439	1, 447, 364

RECAPITULATION.

Number of letters and pieces of paper-mail distributed during the year..... 2, 648, 661, 550
 Number of errors made in the distribution of same 763, 511
 Number of letters and pieces of paper-mail distributed to each error 3, 469

The report shows an increase of over 400,000,000 pieces of mail handled on the postal cars, or nearly 20 per cent. This amount would have been still larger but for the yellow-fever epidemic in some of the States comprised in the fourth division during the summer and fall of 1878.

The record shows that while the equivalent of 2,648,661,550 separate and individual pieces of mail was distributed by the clerks and route-agents, 763,511 pieces were missent, or one piece in each 3,469 distributed.

ERRORS IN DISTRIBUTION, ETC., MADE BY POST-OFFICE EMPLOYEES.

Attention is invited to Table E.

TABLE E.—Statement of errors in the distribution and forwarding of mails made by post-offices during the fiscal year ending June 30, 1879.

Division.	State.	Class.	Office.	Number of incorrect slips.		Number of errors on in-		Misdirect.			Misdirected.			Remarks.
				correct slips.		correct slips.		Number of letter-	Number of pouches.	Number of canvass	Number of letter-	Number of pouches.	Number of canvass	
First	Maine	First	Bangor	1,662	2,142	15					9	3	27	No slips used.
	do	do	Portland	87	639									
	do	Second	Augusta	57	81									
	do	do	Auburn	27	27									
	do	do	Bath	48	63									
	do	do	Biddeford	108	153									
	do	do	Lewiston	3	3									
	do	do	Rockland	69	117	6							3	
	New Hampshire	do	Concord	12	15									
	do	do	Dover	42	72									
	do	do	Keene	23	33									
	do	do	Manchester	18	27									
	do	do	Nashua	15	27									
	do	do	Portsmouth	27	54									
	Vermont	do	Brattleboro	3	15									
	do	do	Montpelier	42	60									
	do	do	Rutland	6,771	7,971	138					6	27	24	
	Massachusetts	First	Boston	216	278	3					6	6		
	do	do	Fall River	63	75									
	do	do	Lawrence	642	1,263	18					9			
	do	do	Lowell	54	117									
	do	do	Springfield	252	366	24					15			
	do	do	Worcester	6	6									
	do	do	Amherst	12	48	3					6			
	do	Second	Brocton	12	18									
	do	do	Clinton	24	48						3			
	do	do	Fitchburg	24	48									
	do	do	Gloucester	93	105	3								
	do	do	Haverhill	6	9						3			
	do	do	Holyoke	27	42									
	do	do	Leominster	3	3									
	do	do	Lynn	159	195	9								
	do	do	Milford	6	6									
	do	do	New Bedford	87	105									

[illegible]

TABLE E.—Statement of errors in the distribution and forwarding of mails made by post-offices, &c.—Continued.

Division.	State.	Class.	Office.	Number of incorrect slips.			Number of errors on incorrect slips.			Miscellaneous.			Misdirected.			Remarks.
				Number of incorrect slips.	Number of errors on incorrect slips.	Number of letter-packets.	Number of pouches.	Number of canvas bags.	Number of registered packets.	Number of letter-packets.	Number of pouches.	Number of canvas bags.	Number of letter-packets.	Number of pouches.	Number of canvas bags.	
Second.	Pennsylvania.	First.	Philadelphia.	4,877	14,073	26							88	1	21	
	do	do	Pittsburgh.	2,814	8,716	21							23		2	
	do	Second.	Allegheny.	35	54				2							
	do	do	Allentown.	35	262	0							1		1	
	do	do	Altoona.	107	190	2										
	do	do	Barnhart's Mills.	26	31	1										
	do	do	Bradford.													
	do	do	Chester.	43	56											
	do	do	Corry.	161	214								1			
	do	do	Easton.	163	222			1								
	do	do	Erie.	10	61	1										
	do	do	Franklin.	42	51											
	do	do	Johnstown.	10	51	4										
	do	do	Knox.	78	112								1			
	do	do	Lancaster.	26	41											
	do	do	Lock Haven.	18	81	1										
	do	do	Meadville.													
	do	do	New Castle.													
	do	do	Oil City.	186	825	3							1			
	do	do	Parker's Landing.	87	69											
	do	do	Petrolia.	8	18											
	do	do	Pittston.	3	4											
	do	do	Pottsville.	29	74	1							1			
	do	do	Reading.	45	78								1			
	do	do	Saint Petersburg.	8	69											
	do	do	Scranton.	12	17											
	do	do	Sharon.	2	2											
	do	do	Titnevillo.	26	20											
	do	do	Towanda.	42	68											
	do	do	Warren.	6	18											
	do	do	Williamsport.	60	103											
	do	do	York.	63	75								2		3	

Delaware	do	Wilmington	Remaining offices in second division	178	291	12	2	9	21	538	3	114	
Total				61,529	118,847	459	18	9					
Maryland, ex. E. Shore	First	Baltimore		2,424	3,611	10							
do	Second	Cumberland		13	24								
District of Columbia	First	Washington		8,100	4,557	84	10	13			1	2	
Virginia	do	Petersburgh		35	48	2							
do	do	Norfolk		146	198	1							
do	do	Richmond		513	663	18					2		
do	Second	Alexandria		176	240	24					4		
do	do	Devauille		33	39								
do	do	Lynchburgh		103	149								
do	do	Staunton		168	247						2		
do	do	Winchester		11	13								
West Virginia	do	Wheeling		142	199	7					3		
Remaining offices in third division				480	625	6							
Total				7,344	10,613	106	10	12			71	1	2
North Carolina	Second	Charlotte		49	93	9	1	2					
do	do	Raleigh		92	120	1					1		
do	do	Wilmington		45	57		1						
South Carolina	First	Charleston		624	907	14	1				11		
do	Second	Columbia		285	455	7	1		5				
Georgia	First	Atlanta		271	395						2		
do	do	Savannah		629	773	11					4		
do	Second	Augusta		405	589	13	2	3	1		4	2	
do	do	Columbus		141	172	3					1		
do	do	Macon		329	449	38	7	1	1		5	3	
Florida	do	Jacksonville		183	285	3							
do	do	Pensacola											
Alabama	First	Mobile		78	92	4							
do	Second	Eufaula									2		
do	do	Montgomery		157	294	2	6	1			1	1	
do	do	Selma		76	113						2		
Mississippi	do	Jackson		60	81	1							
do	do	Natchez		17	22								
do	do	Vicksburgh		65	106	2	2						
Louisiana	First	New Orleans		763	1,098	6		1			6	1	
do	Second	Shreveport		214	312	7					6		
Remaining offices in fourth division				661	1,052	6	2				6	4	
Total				5,139	7,331	121	24	9	7		55	9	4
Indiana	First	Evansville		666	1,068	3	1	1				1	
do	do	Fort Wayne		89	132	3							
do	do	Indianapolis		3,854	5,845	45	2	1			18	7	
do	do	La Fayette		140	223	11	1				8	1	
do	Second	Crawfordsville		132	237								
do	do	Elkhart		10	16								

None given.

None given.

TABLE E.—Statement of errors in the distribution and forwarding of mails made by post-offices, &c.—Continued.

Division.	State.	Class.	Office.	Number of incorrect slips.	Number of errors on in- correct slips.	Misdirected.						Remarks.		
						Number of letter- packages.	Number of pouches.	Number of canvas bags.	Number of regis- tered packages.	Number of letter- packages.	Number of pouches.		Number of canvas bags.	
Fifth	Indiana	First	Greencastle	87	43	2								
	do	do	La Porte	10	13									
	do	do	Logansport	112	150	11		1						
	do	do	Madison	106	168	2								
	do	do	New Albany	279	376									
	do	do	Perru	8	5									
	do	do	Richmond	381	548	8	1							
	do	do	South Bend	14	14									
	do	do	Terre Haute	243	351	5								
	do	do	Vincennes	183	263	3								
	Ohio	do	First	Cincinnati	16,726	228	228	4	8		105	2	80	
		do	do	Cleveland	2,384	6,882	11				30			
		do	do	Columbus	2,119	4,098	82				21	2	10	
		do	do	Dayton	1,776	1,213	8		1					
		do	do	Dayton	140	227	3				1		1	
		do	Second	Akron	20	23	1							
do		do	Ashtabula	60	110									
do		do	Canton	50	84	1								
do		do	Chillicothe	52	57									
do		do	Delaware	80	62									
do	do	do	Elmira	30	30									
	do	do	Frederick	84	86	1								
	do	do	Hamilton	155	224	2								
	do	do	Massfield	166	267	6	2			2	1			
	do	do	Massillon	25	77									
	do	do	Mount Vernon	16	23									
	do	do	Newark	808	476	8								
	do	do	Norwalk	12	19									
	do	do	Oberlin	74	18									
	do	do	Painesville	76	115	1								
	do	do	Piquette	148	188	2	1			1	2			
	do	do	Portsmouth	148	188	2								
	do	do	Springfield	47	71									
	do	do	Stouenville	204	736	1	1				7		1	

[illegible]

TABLE E.—Statement of errors in the distribution and forwarding of mails made by post-offices, &c.—Continued.

Division.	State.	Class.	Office.	Number of incorrect slips.	Number of errors on incorrect slips.	Misent.			Misdirected.			Remarks.
						Number of letter-packages.	Number of pouches.	Number of canvas bags.	Number of letter-packages.	Number of pouches.	Number of canvas bags.	
Sixth.	Illinois	Second	Pekin	58	103	1	...	...	...	...	...
	do	do	Princeton	4	4	...	...	...	...	...	...
do	do	do	Rockford	603	997	3	...	...	3	...	8	
do	do	do	Rock Island	18	41	1	...	...	...	...	...
do	do	do	Shelbyville	2	2	...	...	...	...	...	...
do	do	do	Sterling	...	...	...	...	...	...	...	...
do	do	do	Streator	...	...	1	...	...	...	...	...
do	do	do	Sycamore	1	1	...	...	...	...	...	...
Iowa	do	First	Burlington	257	561	7	...	...	7	3	...	
	do	do	Davenport	383	536	1	...	...	3	...	...
do	do	do	Des Moines	129	177	5	...	...	1	...	...
do	do	do	Dubuque	130	174	1	...	...	...	...	...
do	do	do	Atlantic	...	...	...	...	...	1	...	...
do	do	Second	Cedar Falls	10	10	2	...	...	...	...	...
do	do	do	Cedar Rapids	24	43	19	...	...	3	...	...
do	do	do	Clinton	60	140	...	...	...	...	...	...
do	do	do	Council Bluffs	276	493	14	...	...	4	...	...
do	do	do	Decorah	3	...	...	...	...	...	...	...
do	do	do	Independence	8	13	7	...	...	...	...	...
do	do	do	Iowa City	12	13	...	...	...	...	...	...
do	do	do	Kokuk	49	63	20	...	...	1	1	...	
do	do	do	Marshalltown	70	77	1	...	...	...	...	...
do	do	do	Mount Pleasant	...	...	...	...	...	...	...	...
do	do	do	Muscatine	163	297	7	...	...	8	...	1	
do	do	do	Newton	...	...	...	...	...	...	...	...
do	do	do	Oakalosa	1	1	...	...	...	...	...	...
do	do	do	Ottumwa	181	260	7	...	...	...	...	...
do	do	do	Red Oak	16	19	...	...	...	1	...	...
do	do	do	Sioux City	27	34	...	...	...	3	...	...
do	do	Second	Vinton	...	...	...	...	...	...	...	...
do	do	do	Waterloo	71	120	1	...	...	...	...	...
do	do	First	Millwaukee	1,894	1,813	10	...	...	21	1	1	
do	do	Second	Arlington	147	160	3	...	...	2	...	...
do	do	do	Butter Dam	...	...	...	...	...	...	...	...

	do	do	Beloit	79	90	1	1
do	do	Chippewa Falls	1	1			
do	do	Racine	288	463	7		1
do	do	Fond du Lac	59	90	2		2
do	do	Green Bay	2	2			3
do	do	Janesville	3	3			
do	do	Kenosha	3	3			
do	do	La Crosse	8	9	1		1
do	do	Madison	90	105			2
do	do	Oshkosh	121	218	4		2
do	do	Portage					
do	do	Racine	34	34			
do	do	Ripon					1
do	do	Sparta					
do	do	Watertown	11	18	1		
do	do	White Water					
do	First	Minneapolis	224	290	1		1
do	do	Saint Paul	200	344	13		2
do	Second	Lake City					
do	do	Mankato	2	2			
do	do	Red Wing	52	88			1
do	do	Rochester					
do	do	Stillwater					
do	do	Winona	15	21			
do	do	Omaha	52	65			
do	First	Lincoln	804	484	16	1	3
do	Second	Nebraska City	89	139	2		1
do	do	Deadwood	124	207	6		2
do	do	Yankton					2
do	do	Cheyenne City	24	26			1
do	do	Laramie	191	250	4		2
do	do	Calumet					
do	do	Jehpeming					
do	do	Marquette	7	46			
do	do	Remaining offices in sixth division	1, 054	1, 784	75	4	72
do	do	Total	62, 362	87, 290	319	7	475
do	do						19
do	do						7
Missouri	First.	Kansas City	1, 336	2, 059			6
do	do	Saint Joseph	535	741	45	3	2
do	do	Saint Louis	8, 609	12, 378	75	15	
do	Second.	Hannibal	568	887	13	2	3
do	do	Jefferson City	146	213	3		
do	do	Sedalia	163	247	1		
do	do	Springfield	110	155	1		
do	do	Leavenworth	698	1, 177	8		1
do	First.	Atchison	228	308	10		
do	Second.	Emporia	10	14	1		
do	do	Fort Scott	113	181	1		
do	do	Lawrence	420	575	16		2
do	do	Topeka	396	579	4		1
Seventh	do						

TABLE E.—Statement of errors in the distribution and forwarding of mails made by post-offices, &c.—Continued.

Division.	State.	Class.	Office.	Number of incorrect slips.	Number of errors on in-correct slips.	Misdirected.			Remarks.
						Number of letter-packets.	Number of pouches.	Number of canvas bags.	
Seventh	Kansas	Second	Wichita	294	398	2			
	do	do	W yandotte	46	74				
	Arkansas	do	Carsiana	43	64				
	do	do	Hot Springs	585	757	6	8		
	do	do	Little Rock	189	239	2	1		
	Texas	do	Austin	481	680	1	1		
	do	do	Dallas	558	711	5	1		
	do	do	Denison	83	51	1			
	do	do	Fort Worth	1,708	8	1			
	do	do	Galveston	1,138	10	1	2		
	do	do	Houston	324	551	2	1		
	do	do	Marshall	184	324				
	do	do	San Antonio	287	400		2		
	do	do	Sherman	674	880		1		
	do	do	Waco	1,043	1,853	3	4		
	Colorado	do	Black Hawk	177	247	2			
	do	do	Boulder	765	1,259	14	1		
	do	do	Denver	5	14		1		
	do	do	Georgetown	58	238		8		
	do	do	Leadville	2,567	4,267	87	2		
	do	do	Remaining offices in seventh division.	22,411	35,498	308	13	30	
			Total				43		
Eighth	California	First.	San Francisco	1,129	40				
	do	Second.	Grass Valley	52					
	do	do	Los Angeles	25					
	do	do	Marysville	13					
	do	do	San Francisco	243					
	do	do	San Jose	44					
	do	do	Portland	166					
	Oregon	do	Portland	173					
	Utah	do	Salt Lake City	73					
									Incorrect slips in this division not given.

Nevada.....	do	Virginia City	120 872
Ninth.....	First.....	Remaining offices in eighth division.	5
Michigan.....	Second.....	Total.....	28
do	do	Detroit.....	5,024
do	do	Grand Rapids.....	183
do	do	Adrian.....	28
do	do	Alpena.....	2
do	do	Ann Arbor.....	63
do	do	Battle Creek.....	197
do	do	Bay City.....	284
do	do	Coldwater.....	5
do	do	East Saginaw.....	9
do	do	Flint.....	16
do	do	Hudson.....	89
do	do	Jackson.....	76
do	do	Kalamazoo.....	127
do	do	Lansing.....	87
do	do	Manistee.....	96
do	do	Marshall.....	11
do	do	Monroe.....	20
do	do	Muskegon.....	1
do	do	Niles.....	140
do	do	Pontiac.....	180
do	do	Saginaw.....	1
do	do	Ypsilanti.....	51
do	do	Remaining offices in ninth division.....	88
do	do	Total.....	167
do	do		291
do	do		5
do	do		144
do	do		206
do	do		10
do	do		11
do	do		40
do	do		1
do	do		1
do	do		14
do	do		17
do	do		11
do	do		11
do	do		31
do	do		79
do	do		628
do	do		1
do	do		8
do	do		1
do	do		9
do	do		9,604
do	do		275
do	do		15
do	do		20
do	do		8
do	do		1
do	do		9

RECAPITULATION.

Errors by divisions.	Number of incor- rect slips.	Number of errors on incorrect slips.	Misent.				Misdirected.		
			Number of pouches.	Number of bags.	Number of registered packages.	Number of letter-pack- ages.	Number of letter-pack- ages.	Number of pouches.	Number of bags.
First	13,734	19,674	396	9	27	114	114	88	83
Second	61,529	113,347	459	9	21	538	538	1	114
Third	7,844	10,613	106	12	.....	71	71	3	2
Fourth	5,159	7,321	121	9	.....	15	15	1	4
Fifth	41,980	78,706	536	14	7	268	268	17	61
Sixth	62,362	87,260	319	1	8	475	475	10	7
Seventh	23,411	35,433	368	30	.....	42	42	.....	.....
Eighth	2,452	53	28	.....	.....	.....	.....	.....	.....
Ninth	6,694	9,604	15	20	.....	8	8	1	9
Total	224,655	363,076	142	104	58	1,560	1,560	88	280

The gross amount of errors in this table seems large, yet in comparison with the amount of mail distributed, or the number of errors per thousand pieces handled, it is very light.

CASE EXAMINATIONS.

Attention is called to the report of case examinations, Table F.

TABLE F.—Statement of case examinations of railway post-office clerks and route agents in the several divisions of the railway mail service for the year ended June 30, 1879.

Division.	Whole number of examinations.	Whole number of cards handled.	Number of cards correct.	Number of cards incorrect.	Number not known.	Average per cent. correct.
First	173	87,547	77,483	6,406	3,658	88.54
Second*	1,306	2,406,464	1,120,458	1,134,768	151,238	46.55
Third	181	89,863	88,061	1,706	96	98.00
Fourth	415	236,036	216,985	14,312	4,739	91.92
Fifth	1,702	1,467,427	1,291,044	79,370	97,013	87.98
Sixth	443	485,946	432,284	14,484	39,178	88.95
Seventh	316	241,956	216,029	17,010	8,920	89.28
Eighth	36	33,397	32,719	306	372	97.97
Ninth	615	814,125	620,816	40,290	153,019	78.25

* 613 employes examined on 2,800 cards and over; 131 employes made 90 per cent. and over.

RECAPITULATION.

Total number of examinations	5,137
Total number of cards handled	5,862,764
Total number of cards correct	4,095,879
Total number of cards incorrect	1,308,652
Total number of cards not known	458,233
Average per cent. correct of all divisions	69.86

It will be seen that the proficiency has been maintained, notwithstanding the employes have handled two million more cards than were shown in the last annual report.

CASUALTIES.

It will be seen from the following list of casualties, Table G, the great risk of life and limb the employes of this service run in the performance of their duties.

During the year four clerks were killed, and a large number seriously injured and maimed—in some cases being unable to perform duty for months. There is no provision made for filling their places while thus incapacitated, consequently their work devolves upon their fellow-clerks, who have to perform it in addition to their own already onerous duties. I fully concur with the recommendation of my predecessor, that some method should be adopted, either by allowing pay for a certain period to the killed in service or pensioning the wounded in proportion to their disabilities and length of time in which they are incapacitated from service.

I can hardly think that any other appeal than the list of casualties in question is necessary to impress upon Congress the justice of this.

TABLE G.—*Statement of casualties in the railway mail service during the fiscal year ended June 30, 1879.*

1878.

July 2.—Steamer Capitol City, of the Saint Louis and Memphis Anchor Line Company, was burned about two o'clock in the morning and was totally destroyed. Two passengers were burned to death, about twenty bags of mail were destroyed, and of the entire contents only about thirty or forty packages were rescued in anything like a good condition.

July 28.—New York and Pittsburgh Railway Post-Office. The paper-car on train No. 1 west, when near Germantown Junction, Pa., was discovered to be on fire, supposed to have caught from sparks from the engine; the train was stopped and the fire, which was confined to Kentucky State papers, was in a few moments extinguished. On examination it was found that six sacks of Kentucky mail were more or less damaged by fire; all but about half a sackful was, however, forwarded to destination.

August 7.—Pittsburgh, Cincinnati and Saint Louis Railway Post-Office. Train No. 6, due to leave Pittsburgh at 11.25 p. m., left that point about thirty minutes late. When near Mingo Junction at two o'clock in the morning, ran into an east-bound freight-train which was running on the time of the passenger-train. The conductor of the freight-train stated that his watch lost twenty minutes in running twenty-seven miles, and he supposed he had ample time to clear the track for the passenger-train. Eleven persons were killed, and between twenty-five and thirty injured. There were two postal cars on the train—one for Cincinnati and one for Saint Louis, the Cincinnati car being ahead of the Saint Louis car. There were four men in the Cincinnati car and three men in the Saint Louis car. Of the four men in the Cincinnati car three were killed, viz, F. D. Graham, head clerk; A. W. Andrews, assistant local agent, and W. H. Johnson, assistant clerk; and Geo. L. Moreau, clerk, was so badly injured that he was unable to perform duty for four months. The clerks in the Saint Louis car were quite seriously injured, and two of them were unable for duty for some days. The Cincinnati postal car was a complete wreck, and was afterwards burned up. Nearly all the mail was saved, except such as was ground up in the wreck.

September 30.—Louisville and Nashville Railway Post-Office. Train No. 3 on this line, with postal car attached, was thrown from the track at Smith's Grove, Ky., by a misplaced switch and badly wrecked. Mr. R. A. Murray, clerk railway post-office, had his leg broken in the accident. None of the other clerks were seriously injured. The postal car was considerably damaged, but the damage to the mail was only trifling.

October 12.—Kelton and The Dalles Railroad. The whole of the mail that left Kelton on the morning of the 11th of October was destroyed by fire at Rattlesnake Station.

October 31.—Scioto Valley Railroad, Columbus and Portsmouth Route. Train on this line, when between Piketon and Wetmore, Ohio, left the track at Big Run Station, supposed to be caused by unknown person having misplaced the switch. No person was hurt seriously and no mail was injured or lost.

November 15.—Portland and Ogdensburgh Railroad, Portland and Swanton Route. The train on this route, when near South Malden, Vt., was thrown from the track (by a broken rail) down an embankment, the

mail-car turning upside down. Route Agent F. A. Leland was severely injured. No mail, however, was lost.

November 27.—New York and Hornellsville Railway Post-Office. An accident occurred to train No. 1 on this line about one and a half miles east of Hornellsville, caused by a misplaced switch, throwing the mail-car down an embankment some twenty-five feet and totally wrecking the same. Head Clerk Ira Dorrance and Clerk R. S. Bartlett escaped with severe bruises, and Assistant Clerk B. S. Sweet escaped through the roof without injury. The mails, all being locked, were got out in good order and forwarded to their respective destinations.

December 3.—New York, New Haven and Hartford Railroad, Boston Springfield, and New York Railway Post-Office. In catching the mail at Stratford, Conn., William H. Sanders, assistant clerk, had his hand thrust through the glass of a swinging door, cutting it severely.

December 9.—Saint Louis and Southeastern Railroad. The mail-train bound east on this route was ditched near Belleville, Ill. No mail was lost or injured in the accident, but Route Agent W. D. Slade was somewhat bruised.

December 19.—Lake Shore and Michigan Southern Railroad, New York and Chicago Railway Post-Office. The train on this line, leaving New York at 10.30 a. m., of the 18th, when approaching Erie, Pa., ran into a freight-train, wrecking the engine and considerably damaging postal car No. 611, resulting in a delay of twelve hours to all letter-mail for points west and south of this point. None of the employés were injured and no mail lost or destroyed.

December 21.—Pawling and New York Route. The mail-apartment car on this route, while standing on the track at Pawling, N. Y., was totally destroyed by fire. The fire caught from the stove in the apartment used by the express-messenger, and as the wind was blowing strongly at the time nothing could be saved from the car. Twelve catcher pouches, ten letter pouches, ten iron locks, &c., were destroyed. No mail-matter was, however, destroyed.

December 27.—North Vernon and Louisville Route. Train ran off the track, smashing engine. All mail was saved and delivered as usual.

December 31.—Lake Shore and Michigan Southern Railroad, New York and Chicago Railway Post-Office. Postal car Governor Andrews (paper-car) when nearing Girard, Pa., was observed to be on fire, and was, with its contents, about one hundred sacks of paper-mail (principally for points west of Chicago), almost wholly destroyed. About ten sacks (more or less damaged) were recovered from the débris and turned over to the postmaster at Cleveland, Ohio.

1879.

January 3.—New York Central and Hudson River Railroad. Train No. 8 on this road, coming east, was thrown from the track at Canastota, N. Y., and the express-car containing mail was burned, together with all its contents. It occurred during the storm, when the trains were all blockaded, and this train was made up at Syracuse, N. Y. It is believed that the amount destroyed, however, was not very large and of no very great importance.

January 6.—Savannah and Jacksonville Route.—Train from the east on this route jumped the track one mile west of Reppard's Mill, owing to a broken axle. Five cars were thrown from the track. The ends of the mail and express cars were torn off, but the mail was not injured.

Route Agent C. P. Craft, in charge of the mail, was thrown across the edge of the stove, striking his spine, which disabled him for duty for some days.

January 23.—Dupont and Albany Route. Car No. 6 and two others on train going west on this route, when about two miles west of Pelham, while moving at the rate of about 40 miles an hour, down a heavy grade, was thrown from the track, literally demolishing the trucks and underwork of three cars and slightly injuring Mail-Route Messenger Hardaway. The mail was all gathered together and taken in a box-car to Albany, without any loss whatever.

January 31.—Belton and Walhalla Route. While *en route*, bound west, train was thrown from the track and the mail-car was wrecked, but no loss or damage occurred to the mail or contents.

February 3.—Dupont and Albany Route. Train going east, when 12½ miles west of Thomasville, Ga., car No. 154 ran off the track along with four other cars, turning over and slightly injuring Mail-Route Messenger Few. The mail was somewhat damaged by water and mud, but all was recovered and taken to Thomasville on the engine, in charge of the mail-route messenger.

February 3.—Rochester and Niagara Falls. Mail-train on this route, moving west, collided at Spencerport, N. Y., with a freight-train; the tender and postal car No. 4 telescoped and were thrown down an embankment twenty feet deep, completely wrecking the mail-car, which took fire and was partially burned. Route Agent C. E. Steele escaped with slight bruises. No mail or post-office property was destroyed.

February 3.—De Ruyter and Elmira Route. The mail-train on this route, moving east, was thrown from the track at Cortland, N. Y., and the mail-apartment car was badly wrecked. Route Agent J. K. Holly escaped without injury, and showed good judgment in the transfer of the mails. No mail or post-office property was injured or destroyed.

February 18.—Selma, Rome and Dalton Railroad. The north-bound mail-train on this road fell through a bridge at Mulberry Creek, 13 miles north of Selma, killing and injuring a number of persons and burning mail-car and entire mail. Route Agent N. Y. Hunter in charge of the mail, was badly hurt and burned by coming in contact with the stove in the mail-car, which broke loose from its fastenings and fell upon him, from which injuries he died on March 3, 1879.

February 21.—New York and Dunkirk Railway Post-Office. The postal car on night line when near Cameron, N. Y., was discovered to be on fire in one of the ventilators. The fire was soon extinguished and the car sustained but slight injury. Two empty mail-sacks were burned, which was all the damage done to government property.

February 24.—Atchison, Topeka and Santa Fé. While mail-car on this road was being switched into the yard at Topeka, Kans., it came into contact with another car with such force as to throw J. L. Daugherty, mail-route messenger, who was on duty, violently under the table of the mail-car, thereby causing him to be incapacitated for duty for several days.

March 1.—Pittsburgh, Fort Wayne and Chicago Railroad. Train No. 2, bound east on this road, collided with a freight-train at Valparaiso, Ind., badly smashing the mail-car. The mail was left at the wreck until the arrival of the railway post-office on train No. 6.

March 10.—Detroit and Toledo Railway Post-Office. Train No. 52, when nearing Trenton, Mich., was overtaken and run into by second section of said train, telescoping the caboose and mail-car. No mails, however, were injured or destroyed.

March 27.—Charleston, S. C. In making transfer of mails across the

Ashley River, near Charleston (during temporary repairs to bridge), pouch supposed to be empty fell into the river and was lost. The Charleston and Savannah Railroad Company offered a reward for it, and it was ultimately recovered.

March 28.—Hastings and Montevideo Route. Mail-train No. 2 bound east on this route was wrecked at or near Bougard, Minn., and Route Agent T. D. Strait was somewhat bruised. No mail was lost.

March 31.—Chicago, Clinton, Dubuque and Minnesota Railroad. Lamp in postal car on train on this road bound north, when near Green Island, Iowa, fell down through being insecurely fastened. The flames from the burning lamp set fire to the mail, almost entirely destroying one sack and slightly injuring three other sacks of paper-mail. No letter-mail was injured.

April 3.—Cairo and New Orleans Railway Post-Office. The postal car on train No. 3, on the night of the 3d, coming north from New Orleans, when within two miles of Hazlehurst, Miss., was thrown from the track down an embankment and completely demolished. The end of the car in which is situated the letter-case ran into the tender of the engine, and the mail-matter was badly damaged by steam, water, and dirt. All mail-matter was carefully collected and carried into the Jackson office for adjustment.

April 7.—Central Railroad of New Jersey. Train on this road collided with a freight-train at Asbury, N. J., wrecking mail-car and injuring Route Agent George Mallison to such an extent as to unfit him for duty for some days. No damage was sustained by the mails, which were promptly forwarded.

April 20.—Lake Shore and Michigan Southern Railroad. New York and Chicago Railway Post-Office train No. 21, when near Berea, Ohio, left the track, ditching postal cars Governors Brough and Andrews, both of which were more or less damaged, the Governor Brough being thrown over on its side. Mails were all secured and transferred, causing no delay except to Toledo and Wabash connections. Assistant Clerk August Rees received slight injuries in left arm, and Clerks A. W. Crane, James Baldwin, R. H. Austin, and F. H. Marion were somewhat bruised.

May 22.—Grand Rapids and Elkhart. W. D. Ballou, route-agent on this route, on trip north, in attempting to deliver the mail at Dorr Station while train was in motion, fell from the car-door, receiving slight scalp and bodily bruises. A fainting fit, caused by an injury to a finger received in stamping letters, was the cause of his falling.

June 9.—Dunkirk and Titusville. Train on this route, when near North Warren, Pa., collided with a freight-train, demolishing the mail-car so completely that it was burned by the company. Route Agent Frew jumped from the car and escaped injury. The mail was all saved, some of it in a damaged condition. It was taken to the office of Chief Head Clerk Miller, at Dunkirk, N. Y., put in shape, and forwarded to destination. No government property was destroyed.

June 14.—Indianapolis and Terre Haute. Train No. 8 on this route, bound west, when 3 miles west of Fillmore, Ind., encountered a storm of wind and rain, which felled a tree across the track, into which the train ran, doing considerable damage and throwing Route Agent John A. Bryan forward on the edge of the letter-case table, injuring him very badly, incapacitating him from duty for nearly three weeks.

UNIFORMS.

The employes were notified that on and after July 1, 1879, they would not be required to wear the uniform, but that such as desired to wear it

were requested to continue its use. The department prescribed a uniform cap, with a wreath encircling the letters R. M. S., to be worn by all employés of this service as a badge while on duty. The words "on duty" were and are intended to mean from the time the employé records his departure until he records his arrival.

CONCLUSION.

In conclusion, I desire to say that some words of commendation should be given to all the employés of this service, from the highest to the lowest, for the untiring zeal and energy displayed by them in the execution of their arduous duties. On their promptness, care, and watchfulness are dependent interests of great magnitude, and I can safely say that the trust reposed in them has not been betrayed.

W. B. THOMPSON,
General Superintendent.

Hon. THOS. J. BRADY,
Second Assistant Postmaster-General.

REPORT
OF THE
THIRD ASSISTANT POSTMASTER-GENERAL.

R E P O R T
OF THE
THIRD ASSISTANT POSTMASTER-GENERAL.

POST-OFFICE DEPARTMENT,
OFFICE OF THIRD ASSISTANT POSTMASTER-GENERAL,
Washington, D. C., November 8, 1879.

EXPLANATION OF ACCOMPANYING TABLES.

SIR : I have the honor to submit the following report of the operations of this office for the fiscal year ending June 30, 1879, and to call especial attention to the subjoined tables, forming part of the same, numbered from 1 to 19, inclusive, viz :

No. 1. Estimates of the appropriations required by the Post-Office Department for the service of the fiscal year ending June 30, 1881.

No. 2. Statement showing appropriations for the fiscal year ending June 30, 1879, and the expenditures made, by items, out of such appropriations, up to September 30, 1879.

No. 3. Statement exhibiting the receipts and expenditures, under appropriate heads, by quarters, for the fiscal year ending June 30, 1879, compared with the fiscal years ending June 30, 1878, and June 30, 1877.

No. 4. Statement showing receipts and disbursements at Treasury depositories during the fiscal year ending June 30, 1879.

No. 5. Statement showing receipts and disbursements at depository post-offices on account of the fiscal year ending June 30, 1879.

Nos. 6 and 7. Statements showing the number and value of postage-stamps, stamped envelopes, newspaper-wrappers, and postal cards issued during the fiscal year ending June 30, 1879.

No. 8. Statement showing the number and value of official postage-stamps and stamped envelopes furnished each of the executive departments during the fiscal year ending June 30, 1879.

No. 9. Statement showing the increase in the issues of postage-stamps, stamped envelopes, newspaper-wrappers, and postal cards for the fiscal year ending June 30, 1879, over those of the preceding year.

No. 10. Statement showing the amount of dead mail-matter treated in the division of dead letters during the fiscal year ending June 30, 1879.

No. 11. Statement showing the disposition of letters opened in the division of dead letters during the fiscal year ending June 30, 1879.

No. 12. Statement showing the amount, classification, and disposition of unmailable matter received by the division of dead letters during the fiscal year ending June 30, 1879.

No. 13. Statement showing the number of foreign dead letters received and disposed of during the fiscal year ending June 30, 1879.

No. 14. Statement showing the number, classification, and disposition of dead registered letters during the fiscal year ending June 30, 1879.

No. 15. Statement showing the number of registered letters and par-

cels transmitted through the mails from each State and Territory in the United States during the fiscal year ending June 30, 1879.

No. 16. Statement showing the number of packages dispatched in registered through pouches from the post-office at New York to other through-pouch offices, by months, during the fiscal year ending June 30, 1879.

No. 17. Statement showing the number and value of registered packages forwarded during the fiscal year ending June 30, 1879, for the Post-Office and Treasury Departments.

No. 18. Statement showing the operations of the registered-letter system in the cities of New York, Chicago, and Washington during the fiscal year ending June 30, 1879.

No. 19. Statement showing the increase in the amount collected as fees on registered matter at 25 leading post-offices during the fiscal year ending June 30, 1879, over the amount collected during the preceding year.

OPERATIONS OF THE BUREAU.

The work of this office is distributed among the divisions of finance, of postage-stamps, of dead letters, of registration, and of files and records, details of the operations of which are herewith presented, as follows :

DIVISION OF FINANCE.

The appropriations for the service of this office during the fiscal year amounted to \$822,700, and the expenditures to \$714,279.61, leaving an unexpended balance of \$108,420.39, or 13 per cent. of the appropriations. This saving is due to the fact that on the 1st of October, 1878, a new contract for stamped envelopes was entered into at a considerable reduction from the old contract rates, on which the appropriation was based.

The estimated amount of appropriations required to conduct the service of this office for the coming fiscal year is \$882,400, a decrease of \$2,000 from the amount appropriated for the current year. A detailed explanation of the estimates will be found among the papers accompanying the table (No. 1) of estimates attached to this report.

DEPARTMENT RECEIPTS AND EXPENDITURES.

The receipts and expenditures of the department during the fiscal year ended June 30, 1879, as shown by the books of this division, were as follows :

Receipts.

Letter-postage paid in money	\$254,901 41
Box-rents and branch offices	1,381,162 51
Fines and penalties	9,080 12
Postage-stamps, stamped envelopes, newspaper-wrappers, and postal cards	28,145,074 99
Dead letters	3,323 39
Revenue from money-order business	219,226 83
Miscellaneous	29,213 61
Total	30,041,982 86

Expenditures.

The total expenditures for the service of the year were\$33,073,437 82
 An excess over the receipts appertaining to and for the last fiscal year,
 supplied out of appropriations from the Treasury, of..... 3,031,454 96

The expenditures given above do not include the sum of \$376,461.63 paid on liabilities incurred during previous fiscal years.

The total receipts for the year were \$764,465.91 (or 2.6+ per cent.) more than those of the preceding year, and \$1,007,884.58 (or 3.4+ per cent.) more than the estimates therefor. The increase of receipts over the amount estimated is largely attributable to the revival of business, and the consequent increased demand for postage-stamps, postal cards, &c., the sales of which amounted to \$769,481.87 more than for last year, and \$2,387,559.23 more than for 1877.

Excluding official postage-stamps and money-order receipts from both fiscal years, there is an increase of ordinary receipts over past fiscal year of \$671,703.27, or 2.3+ per cent.

Table No. 3, which accompanies this report, shows the receipts and expenditures by fiscal quarters, and the increase or decrease as compared with previous years.

An exhibit of the condition of accounts of the last fiscal year on the 30th of September, 1879, will be found in table No. 2, herewith.

In addition to the receipts stated above, there was drawn from the Treasury, on account of special and deficiency appropriations, the sum of \$3,297,965.25, as follows:

To supply deficiencies in the revenues for the year ended June 30, 1879, act of June 17, 1878.....	\$3,000,000 00
For transportation of the mails, railroads, for 1878 and previous years, act of March 3, 1879.....	166,392 27
For transportation of the mails, deficiency, 1876 and previous years, act of March 3, 1879:	
Railroad routes.....	\$21,775 73
Star routes.....	4,481 29
Steamboat routes.....	750 00
Mail-messenger service.....	1,508 58
Foreign mail transportation.....	17,357 71
	45,873 31
To pay Geo. H. Giddings, late contractor, deficiency, 1876 and previous years, act of March 3, 1879.....	14,583 33
To pay H. G. Boardman, postmaster at Milton, Vt., act of June 19, 1878.....	116 34
For payment of increased salary to letter-carriers, &c., act of June 28, 1879.....	71,000 00
	<u>3,297,965 25</u>

ESTIMATES.

The estimated expenditures for the fiscal year ending June 30, 1881, are. \$39,920,900 00
The estimated revenue for the same year is..... 32,210,000 00

Leaving a deficiency to be appropriated out of the general Treasury of 7,710,900 00

Table No. 1, accompanying this report, furnishes the estimates in detail.

In estimating the revenue for 1880-'81 the item for official postage-stamps was not stated separately, for the reason that official (or penalty) envelopes are, in a large measure, taking the place of official stamps, and the estimated revenue from this source is included in ordinary receipts.

CONDITION OF DEFICIENCY APPROPRIATIONS.

The following statement will show the condition of the appropriations from the general Treasury to supply deficiencies in the postal revenues, viz:

1. For the fiscal year ended June 30, 1877, the amount unexpended

was \$167,498.00, which, by operation of law, was carried into the surplus fund of the Treasury on the 30th June, 1879, leaving no means available for the payment of unsettled liabilities incurred prior to July 1, 1877.

2. For the fiscal year ended June 30, 1878, an additional deficiency appropriation of \$166,392.27 was made, which amount was drawn from the Treasury and placed to the credit of the Post-Office Department for the payment of indebtedness on account of said fiscal year.

3. For the fiscal year ended June 30, 1879, the amount appropriated from the Treasury to supply deficiencies in the revenues was \$1,222,274.72, of which \$1,222,274.72 remains unexpended and available for unadjusted liabilities for said fiscal year.

The unpaid indebtedness of the department for the fiscal year ended June 30, 1879, is estimated at \$713,344.45, for the payment of which there is available, as above stated, the sum of \$1,222,274.72.

RECEIPTS AND DISBURSEMENTS FOR 1879.

The receipts and disbursements at Treasury and Post-Office depositories during the last fiscal year may be briefly summarized thus:

At Treasury depositories:	
Balance subject to draft June 30, 1878.....	\$1,780,260 09
Outstanding warrants, June 30, 1878.....	43,646 15
Aggregate receipts during the year ended June 30, 1879.....	10,745,715 60
Total	12,569,611 84
Amount of warrants paid during the year.....	9,896,823 4-
Balance at depositories June 30, 1879	2,672,818 36
Outstanding warrants, June 30, 1879.....	52,454 13
Balance subject to draft June 30, 1879	2,620,334 23

Transactions at these depositories, in detail, with amount of increase or decrease, as compared with previous years, are shown in table No. 4, accompanying this report.

At Post-Office depositories:	
Balance subject to draft June 30, 1878.....	\$530,747 47
Deduct credit balance June 30, 1878.....	2,753 94
Aggregate receipts during the year ended June 30, 1879	3,901,798 04
Total	4,429,791 57
Disbursements during the year.....	3,729,096 51
Amount subject to draft June 30, 1879	700,695 06

Table No. 5, submitted with this report, exhibits the receipts and disbursements at the different Post-Office depositories in detail.

CONTRACTS ENTERED AND ACCOUNTS KEPT.

During the year there were 3,895 contracts for mail service (including 1,150 sub-contracts) received from the Second Assistant Postmaster-General, and 12,700 orders of the Postmaster-General recognizing mail service not under contract, curtailing or extending service or modifying previous orders; being an increase of 1,224 contracts and of 3,764 orders, as compared with the previous year. These contracts were examined, verified, and entered upon the books of the division for reference when passing upon reports from the Auditor for the payment of mail-contractors and other creditors of the department. The number

of such reports received and adjusted during the year was 33,950, (an increase of 4,650 over the previous year.)

Accounts were kept with the Treasury, 9 sub-treasuries, and 40 designated depositories, involving the sum of \$10,745,715.60, against which 12,718 warrants were issued.

Accounts were also kept with 99 Post-Office depositories, involving the sum of \$3,901,798.04, of which \$2,890,896.17 arose from the proceeds of the depository offices themselves; \$924,782.49 from deposits by other offices; and \$86,119.38 from collection drafts. Against the accumulations in the depository offices 21,916 drafts were issued, amounting to \$2,510,922.73. In addition to the amount paid out by draft, the sum of \$1,218,173.78 was paid to route-agents, railway-post-office clerks, mail-messengers, and letter-carriers, by the postmasters authorized to make such payments, the accounts for which were rendered monthly to this office.

Upon the deposit desk of this division a record of 10,847 depositing offices was kept (an increase of 8,066 over previous year); 23,712 certificates of deposit were received and entered (an increase of 12,588 over previous year); 13,323 circulars of instruction and inquiry, with Auditor's statements of account, were forwarded to postmasters; and 3,283 letters from postmasters relative to balances due were received, noted upon the books, and properly referred or answered.

DIVISION OF POSTAGE-STAMPS, STAMPED ENVELOPES, AND POSTAL CARDS.

The operations of this division during the year may be summarized as follows: The number of ordinary postage-stamps issued to postmasters for sale to the public was 774,358,780, of the value of \$20,117,259; of special stamps for the collection of postage due (issued in anticipation of the wants of postmasters), 15,667,600, of the value of \$365,957; of newspaper and periodical stamps, 1,552,172, of the value of \$1,088,412.16; of postal cards, 221,797,000, of the value of \$2,217,970; of ordinary stamped envelopes, 80,806,700, of the value of \$2,160,417.92; of stamped envelopes bearing a request to return, 67,058,250, of the value of \$2,139,704.10; of newspaper wrappers, 29,697,000, of the value of \$355,218.90; of official postage-stamps issued to the several executive departments for official use, 14,201,822, of the value of \$624,999.95; of official stamped envelopes and wrappers, 17,209,150, of the value of \$469,011.90; making a total number of 1,222,348,474 and a total value of \$29,538,950.93.

These issues show an increase in value over those of the preceding year as follows: Of ordinary stamps, \$648,641, or 3.33 per cent.; of newspaper wrappers, \$50,573.30, or 16.6 per cent.; of postal cards, \$211,670, or 10.55 per cent.; and of official postage-stamps, \$6,905.35, or 1.11 per cent. They show, also, a decrease in the value of the following: Of newspaper and periodical stamps, \$5,433.14, or .04 per cent.; of ordinary stamped envelopes, \$257,684.99, or 10.65 per cent.; of special-request stamped envelopes, \$43,321.15, or 1.98 per cent.; and of official stamped envelopes, \$5,541.20, or 1.16 per cent.

The total increase in the value of the ordinary issues (including postage-due stamps, which were issued for the first time on the 9th of May last) was \$970,402.02, or 3.53 per cent.; of the ordinary and official issues combined, \$971,766.17, or 3.40 per cent.

In addition to the foregoing articles there were issued 5,529,000 registered-package envelopes, 19,917,950 post-office envelopes (including

the free (penalty) envelopes), and 1,505,000 dead-letter envelopes, making a total of 26,951,950; also, 2,529 receipt-books used in the collection of postage on newspaper and periodical matter sent through the mails.

The following shows the number of postmasters' requisitions filled during the year:

For ordinary postage-stamps.....	110,959
For postage-due stamps.....	40,344
For newspaper and periodical stamps.....	6,949
For ordinary stamped envelopes and wrappers, plain.....	50,946
For special-request stamped envelopes.....	67,501
For postal cards.....	52,602
For official postage-stamps.....	22,432
For official stamped envelopes and wrappers.....	2,566
For registered package envelopes.....	44,173
For post-office envelopes.....	39,333
For newspaper and periodical receipt-books.....	2,529
Total.....	452,083

The increase in this total over the total of requisitions filled during the preceding year is 34,391, or 8.2 per cent.

To fill these requisitions the following number of packages was made up and forwarded:

Of ordinary stamps.....	112,467
Of postage-due stamps.....	40,344
Of newspaper and periodical stamps.....	6,949
Of ordinary stamped envelopes.....	73,702
Of special-request stamped envelopes.....	52,602
Of postal cards.....	61,846
Of official postage-stamps.....	22,432
Of official stamped envelopes.....	5,633
Of registered package envelopes.....	44,326
Of post-office envelopes.....	66,627
Of newspaper and periodical receipt-books.....	2,529
Total.....	495,501

This shows an increase over the preceding year of 34,814 packages.

The number of packages lost during the year was five, and in each case the loss was from causes over which the department had no control.

Besides the business represented by the foregoing figures, a large amount of work was done in keeping the accounts of postmasters, in the preparation of the permanent records of the department, in correspondence, in the auditing of claims for losses by fire, in the examination of newspaper receipt-books returned to the department, and in a number of other matters which it would be difficult to enumerate.

POSTAGE COLLECTED ON SECOND-CLASS MATTER.

The amount of postage collected during the year on newspaper and periodical matter mailed from regular offices of publication to subscribers is as follows:


On 42,958,033 pounds, at 2 cents per pound.....	\$859,167
On 8,167,467 pounds, at 3 cents per pound.....	245,034
Total.....	1,104,141

This total shows an increase over the amount collected during the previous fiscal year of \$79,003.69, which is very gratifying, in view of the fact that since the 1st day of May last the rate of postage on newspaper and periodical matter has been reduced to a uniform rate of 1 cent per pound, under the act of Congress approved March 3, 1879.

The whole number of post-offices at which newspaper and periodical postage is collected is 4,188, being 241 more than during the previous year.

WEIGHT OF SECOND-CLASS MATTER MAILED.

The following table shows the number of pounds of newspaper and periodical matter mailed, and the amount of postage collected on the same, at six of the principal post-offices in the United States:

	Post-offices.	Matter mailed weekly and of tenor, twocents per pound.	Other matter, three cents per pound.	Amount of postage.	Per cent. of total amount collected in United States.
Boston.....		2,867,892	370,482	\$68,472 30	6.2
Chicago.....		3,716,188	548,888	90,790 60	8.2
Cincinnati.....		1,829,189	237,210	43,699 08	4.0
New York.....		13,262,246	2,619,416	343,827 40	31.1
Philadelphia.....		1,656,636	868,340	59,182 92	5.4
Saint Louis.....		2,071,634	185,593	47,000 47	4.2
Total.....		25,403,745	4,829,929	652,972 77	59.1

POSTAGE-DUE STAMPS.

Under a provision in the act of Congress approved March 3, 1879, authorizing a change in the mode of collecting postage due on matter arriving at destination through the mails, the department began issuing on the 9th of May special stamps, called postage-due stamps, of the denominations of 1, 2, 3, and 5 cents, and subsequently of the additional denominations of 10, 30, and 50 cents.

Before the 1st of July every office in the country was provided with a supply of these stamps, and the new system of collecting short-paid postage is now fairly in operation. It is expected to result in an increase of revenue to the department from that source. The stamps may be described as follows: Large figures, representing the denominations, are placed in the center of the stamp, and are surrounded by an oval of very delicate lathe work. On the upper border of this oval the words "Postage Due" are printed in white letters; on the lower border is the denomination, in letters of the same kind. On either side of the oval are the letters "U. S." in small white shields. Around the oval is a form of complex character, described upon an oblong tablet. The general design is the same for all the stamps, the only difference being in the figures and lettering for the several denominations. The color of all is the same—a reddish-brown.

INTERNATIONAL POSTAL CARDS.

The department has not yet begun the issue of the 2-cent international postal card, authorized by the act above referred to, the plates for the same having only recently been completed by the Treasury Department. The contractors, however, are making preparations to begin manufacturing at an early date, and it is expected that they will be in use before the 1st of January next.

DIVISION OF REGISTRATION.

The total number of letters and parcels registered during the year was 5,429,022, of which 4,227,079 were domestic letters, 203,497 domestic

parcels of third and fourth class matter, 163,684 letters registered to foreign countries, 3,097 parcels of third and fourth class matter registered to foreign countries, and 831,665 letters and parcels of official matter forwarded for the government, and by law exempted from the payment of registry fees. The amount of registry fees collected during the year was \$459,735.70, an increase over the preceding year of \$44,736.40. The increase in the number of letters and parcels forwarded was 530,218. The actual losses of registered matter during the year were small, consisting of only 989 letters and parcels, or, say, one out of every seven thousand forwarded.

Table No. 15 accompanying this report shows in detail, by quarters, the number of domestic, foreign, and free letters and parcels that were registered in each State and Territory during the year, the amount of fees collected, and the increase over the preceding year.

Table No. 16 exhibits the number of packages dispatched in registered through pouches from the New York office during the year.

In table No. 17 will be found an exhibit of registered matter forwarded for the Post Office and Treasury Departments during the year. It will be observed that the value of this matter aggregates the enormous sum of \$1,031,517,445.10.

Table No. 18 contains a statement of the registry business done during the year at the post-offices at New York, Chicago, and Washington.

In table No. 19 are some interesting statistics, showing the amount of fees collected (excluding free matter) at the twenty-five leading offices of the country. The fees at these offices amounted to \$78,467.90, or 17.07 per cent. of the total amount collected, and an increase over the previous year of \$20,998, or 36.25 per cent. The remaining offices collected \$381,267.80, or 82.93 per cent. of the total amount, and an increase over the previous year of \$24,189.70, or 6.77 per cent. The New York post-office collected \$27,737.50, or 6.03 per cent. of the total amount, and an increase over the previous year of \$8,789.80, or 46.04 per cent.

REGISTRATION OF THIRD AND FOURTH CLASS MATTER.

In the annual report of last year brief mention was made of the extension on the 1st October, 1878, of the registry system to third-class matter, since then by law subdivided into two classes designated as the third and fourth classes. The step was taken after careful consideration. The law provided generally for the registration of valuable matter, but the system had been confined to letters or matter chargeable with first-class rates of postage. There appeared to be no good reason for the limitation.

The law required the admission into the mails of samples of merchandise and other small articles, and it seemed to be only the duty of the department to extend to this class of matter the additional security afforded by registration, especially since that portion of the work could be done at a profit. The success of the measure has been amply demonstrated. No serious difficulties have been experienced in carrying it into practical operation, and as public attention has become directed to its advantages the business has steadily and rapidly increased.

The postmaster at New York, in reporting the operations of the registry division of his office during the fiscal year, refers as follows to the registration of third and fourth class matter:

The extension of the registry system on October 1, 1878, to include third and fourth class matter, has been the great event of the year.

From the beginning it was regarded by the public with great favor, and the amount of such matter registered has steadily increased and will continue.

Of the 69,644 parcels of third and fourth class matter sent registered from this office there have been but five complaints of loss, and these are on stage-routes in the far Western Territories, and may prove after investigation to be delays through carelessness. It speaks well for the efficiency of the registry system that such an immense amount of heavy matter can be suddenly thrown into it, and the only effect be that of showing the perfection of the system. There have been scarcely any complaints of losses of contents of any of the parcels sent, and most of those investigated show mistakes on the part of the sender. A larger amount of sample and merchandise parcels, formerly sent in ordinary mail, now go forward registered; consequently there is a great diminution in the ordinary mail complaints respecting such parcels. It could not well be otherwise, as the registered matter being inspected before it is registered, all imperfections as to address, insecure wrapping, &c., are corrected by the sender, the evidence of their being mailed is positive, and the parcels are carefully secured before dispatch. This cannot be obtained where they are dropped into the ordinary mails.

REVISION OF THE REGISTRY SYSTEM.

The registry system was given much attention during the year. The rules governing its conduct were thoroughly revised in preparing the new edition of the Postal Laws and Regulations, and the methods greatly simplified. Useless details were dispensed with, and valuable improvements added. The work of conducting the system has been greatly lessened, without detracting from its security.

The principal changes may be noted as follows:

1. *Abolition of distributing offices.*—By this change all registered matter is mailed direct to the office of destination without the intervention of the distributing offices, which are thus saved the labor of making up new invoices and keeping records of registered packages in transit.

2. *Extension of through-pouch system.*—As a result of the change noted above, the through-pouch system, the operations of which have been explained in previous reports, has been largely extended by the addition of many new through-pouch offices, and the multiplication of exchanges between offices authorized to use the through pouches. These changes have greatly facilitated the dispatch of registered matter, and at the same time increased its security.

3. *Abolition of the return-registered-letter bill.*—The registered-letter bill and the return-registered-letter bill were in effect duplicate invoices as between postmasters, the former being retained at the receiving office, and the latter returned to the dispatching office as a voucher. The registered-letter bill has been made to serve both purposes by requiring the receiving postmaster to return it with his acknowledgment to the dispatching postmaster, and a considerable saving of clerical labor was accordingly effected by dispensing with the one bill. The single bill now in use has been designated as the Registry Bill.

4. *Combination of records.*—The "Registered-Receipt Book" and "Account of Registered Letters Sent," two separate records kept at the mailing office of matter received from the public and forwarded, have been combined into one book designated as the "Registration Book, or Account of Matter Registered and Dispatched." At the office of destination, the two separate records, of "Registered Letters Received for Delivery," and "Account of Registered Letters Delivered," have been united in one book, called the "Record of Registered Matter Received and Delivered." Duplicate entries of registered matter handled have been avoided at both the mailing and dispatching offices, leading to a very material reduction of labor.

5. *Adoption of blanks on card form.*—The registry-return receipt (the receipt which by law the sender of a registered parcel is entitled to from the addressee) has been placed on cardboard of the size, form, and quality of the postal card in public use, and forwarded through the mails without inclosure in envelopes. The plan is really that of adapting the

postal card to official purposes. On one side of the card is a form for the signature of the addressee, and on the other the name and residence of the sender so arranged as to constitute a return address. Less writing is required on the card than on the paper form it superseded; and as each card takes the place of a paper form and two envelopes, the great economy of clerical labor and material will be readily apparent in view of the volume of registry business transacted.

The registry bill previously referred to has also been put on card form, with equally beneficial results. This improvement has been the subject of warm commendation from postmasters. As there can be no doubt that this improvement, so advantageously begun in the registry system, is equally well adapted to other branches of postal business, I respectfully recommend that it be at once put into operation wherever it is applicable.

DIVISION OF FILES, RECORDS, AND MAILS.

The total number of letters and other inclosures received, opened, and examined during the year was 1,231,350, an increase over the previous year of 45,785.

Among the inclosures were 374 containing money, and 4,894 containing stamps and stamped envelopes.

Of the letters received 22,492 were briefed and recorded, and filed after final action had been taken on them, and 7,731 letters written in the bureau were copied, enveloped, and mailed.

DIVISION OF DEAD LETTERS.

The whole number of dead letters and packages received and disposed of during the year was 2,996,513, a decrease of 190,292 from last year's receipts.

The fact that while there has been an increased number of letters mailed annually in this country, a reduced number has been sent to the department as dead, presents an anomaly which can be explained only upon the theory of increasing efficiency of the delivery service and the growing popularity of the return-request system.

The extent of the latter will be illustrated by the statement that of the 533,934 letters mailed in a single day at Baltimore, Boston, New York, and Philadelphia 287,835* bore upon the envelope some clew by which they could be restored to the writer if undelivered, without the intervention of the Dead-Letter Office.

Of the letters opened 16,007 contained \$31,591.49; 13,755 contained drafts, checks, notes, money orders, &c., to the value of \$1,105,762.07; 47,797 contained postage-stamps to the value of \$2,387.53; 24,372 contained receipts, certificates, paid notes, &c.; 24,024 contained photographs; and in 38,306 letters and parcels were found jewelry, books, clothing, merchandise, and miscellaneous articles in endless variety, from a small bottle of choice perfumery to a large box of Limburger cheese.

The increase in the number of letters containing money orders and postage-stamps, and the decrease of those containing money, is attributable to the retirement of fractional currency, which formerly furnished a convenient means of making small remittances by mail.

The mode of treating insufficiently prepaid letters has been slightly modified during the past year, and the present system seems to be the most satisfactory of any which has yet been devised for disposing of that unfortunate class of correspondence. It is as follows: Those that

* These figures are based upon the results of an actual count during the first seven days in November, 1879.

bear a name and address, or a business card, post-office box, or other designation by which the writer can be identified, are immediately restored to the owner, or his attention invited to the deficiency of postage by the postmaster at the mailing office. Of the balance, all "local" or "drop" letters are delivered by the postmasters to the persons addressed, upon payment by them of the necessary postage, after due notice of the fact and cause of detention. The remainder are sent to the Dead-Letter Office, and are at once examined by an expert, who, taking into consideration the places of origin and destination of each letter, determines whether it can be returned to the writer in less time than would be required to collect the postage from the addressee and forward the letter to destination. And each letter is then treated in the way decided to be the quicker. Wherever a doubt exists, or where the difference is very small, the postage is collected and the letter forwarded, thus preserving the seal intact.

The amount of money deposited to the credit of the Post-Office Department from letters which could not be restored to the owners was \$3,323.39.

The value of stamps received for postage on unpaid and short-paid matter forwarded to address, and upon unclaimed third and fourth class matter returned to senders, was \$4,471.70.

Of the whole number (5,262,241) of registered letters and packages mailed in this country during the year, but 2,193 found their way into the Dead-Letter Office; and of these 1,982 were successfully restored to the owners, 177 were filed subject to identification, and 34 are outstanding; that is, opened and sent to postmasters for delivery, and the result not yet reported.

The number of undelivered foreign registered letters was 3,685, which were all returned unopened to the countries of origin and receipt acknowledged.

The number of ordinary foreign dead letters was 147,886, while those mailed in the United States and returned unclaimed by foreign governments was 94,669. This difference is accounted for by the migratory habits of foreigners, who upon reaching this country either fail to furnish a correct post-office address to their kinsmen in the old country or do not profit by their privilege to have mail-matter forwarded from one place to another without additional postage charge.

Tables Nos. 10 to 14 inclusive, herewith submitted, contain minute details of the work accomplished in this division during the year.

COMPENSATION OF POSTMASTERS.

In the annual report for the fiscal year ending June 30, 1877, a large share of attention was given to the abuse in the sale of postage-stamps by reason of the inducements offered postmasters by the large commissions then forming the basis of their compensation, and it was recommended that the law be changed to compensate postmasters at fourth-class offices by commissions on stamps canceled on matter deposited for mailing.

This recommendation was favorably acted upon by Congress, and the new system went into effect on the 1st July, 1878. The beneficial effects of the change have already been made apparent. Estimating the increase in compensation at the same rate as the increase in the sale of stamps (2.8 per cent.) would give the amount required for that purpose under the old system at \$8,201,231.57, or \$1,015,691.82 more than the amount actually expended under the new system. This latter amount

may accordingly be taken as the annual saving by the change. Aside from the pecuniary advantages to the department, the most inestimable benefits have resulted from curing the demoralization wrought among postmasters by speculations in stamps to which they were tempted by the old method of compensation.

I have the honor to be, very respectfully, your obedient servant,

A. D. HAZEN,

Third Assistant Postmaster-General.

Hon. D. M. KEY,
Postmaster-General.

No. 1.—*Estimates of appropriations required for the service of the fiscal year ending June 30, 1881, by the Post-Office Department.*

OFFICE OF THE POSTMASTER-GENERAL.

Mail deprecations and special agents, including amount necessary for fees to United States attorneys, marshals, &c	\$150,000 00
Advertising	35,000 00
Preparation and publication of post-route maps, including constant revision of former editions, and furnishing maps, diagrams, and other information by the topographer and assistants	50,000 00
Miscellaneous items in the Office of the Postmaster-General	3,500 00

OFFICE OF THE FIRST ASSISTANT POSTMASTER-GENERAL.

Compensation to postmasters	7,550,000 00
Clerks in post-offices	3,650,000 00
Letter-carriers	2,500,000 00
Wrapping-paper	20,000 00
Wrapping-twine	50,000 00
Marking and rating stamps	15,000 00
Letter balances, scales, and test weights	10,000 00
Rent, fuel, and light	450,000 00
Office furniture	20,000 00
Stationery	50,000 00
Miscellaneous and incidental items	90,000 00

OFFICE OF THE SECOND ASSISTANT POSTMASTER-GENERAL.

Inland transportation, railroad routes	10,000,000 00
Inland transportation, steamboat routes	900,000 00
Inland transportation, star routes	7,375,000 00
Railway post-office car service	1,350,000 00
For proper facilities on trunk lines	400,000 00
Railway post-office clerks	1,450,000 00
Route-agents	1,225,000 00
Mail-route messengers	200,000 00
Local agents	150,000 00
Mail messengers	725,000 00
Mail locks and keys	150,000 00
Mail bags and mail-bag catchers	200,000 00

OFFICE OF THE THIRD ASSISTANT POSTMASTER-GENERAL.

Postage-stamps	97,000 00
Expenses of agency	8,100 00
Stamped envelopes and newspaper-wrappers	437,000 00
Expenses of agency	16,000 00
Postal cards	211,000 00
Expenses of agency	7,300 00
Registered-package envelopes, locks and seals, and post-office and dead-letter envelopes	100,000 00
Ship, steamboat, and way letters	4,500 00
Engraving, printing, and binding drafts and warrants	1,500 00

OFFICE OF SUPERINTENDENT OF FOREIGN MAILS.

Transportation of foreign mails	\$225,000 00
Balances due foreign countries, including the United States portion of the expenses of the International Bureau at Berne, Switzerland, under the provisions of the Universal Postal Union Convention concluded at Paris, France, June 1, 1878	45,000 00
	<hr/> 39,920,900 00
Estimated amount which will be provided by the department from its own revenue accruing from postages and other sources, viz:	
Ordinary revenues	\$32,000,000 00
Money-order receipts	210,000 00
	<hr/> 32,210,000 00
Leaving a deficiency in the revenue of the Post-Office Department to be provided for out of the general Treasury	7,710,900 00

A. D. HAZEN,

Third Assistant Postmaster-General.

OFFICE OF THIRD ASSISTANT POSTMASTER-GENERAL,

October 15, 1879.

No. 1 a.

POST-OFFICE DEPARTMENT,

OFFICE OF THE CHIEF CLERK TO THE POSTMASTER-GENERAL,

Washington, D. C., September 22, 1879.

SIR: In compliance with the request contained in your letter of the 25th ultimo, I have the honor to submit the following estimates of appropriations necessary for the fiscal year ending June 30, 1881, viz:

For mail depredations and special agents	\$150,000
For preparation and publication of post-route maps	50,000
For advertising	35,000
For miscellaneous items in office of Postmaster-General	3,500

Letters from the chief special agent and the topographer, explanatory of the estimates for their respective branches, are herewith transmitted. For the item of advertising, it will be observed that the estimate is less by \$25,000 than the amount appropriated for the current year.

For miscellaneous items in the office of the Postmaster-General the estimate has been increased \$2,000, for the following reason:

Prior to the fiscal year 1878 it was customary to use unexpended balances of appropriations for the different items of the contingent expenses in the payment of other items not specifically appropriated for, or for which the appropriations were insufficient. Under existing law such balances cannot be used, but must be covered back into the Treasury.

The demands upon the appropriation for "miscellaneous items" have therefore greatly increased, and during the past year the department has frequently been embarrassed by the lack of any available fund from which to pay expenses that were absolutely necessary.

Inasmuch as there is a net decrease of \$23,000 in the above estimates, it is hoped that there will be no objection to the slight increase in the item referred to.

Very respectfully, your obedient servant,

W. A. KNAPP,
Chief Clerk.

Hon. A. D. HAZEN,
Third Assistant Postmaster-General.

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No. 1 b.

POST-OFFICE DEPARTMENT,
DIVISION OF MAIL DEPREDACTIONS,
OFFICE OF CHIEF SPECIAL AGENT,
Washington, D. C., September 19, 1879.

SIR: I am directed by the Postmaster General to request that an appropriation corresponding with that for the current fiscal year be asked of Congress in the estimate to be furnished for next year for special agents and mail depredations, viz: One hundred and fifty thousand dollars. The amounts now paid to agents as salaries, although low, together with the large disbursements as rewards and expenses incurred in securing arrests of highwaymen on the frontier, consume the full amount, and more could be profitably expended. Still it has been decided not to ask any increase.

Very respectfully,

DAVID B. PARKER,
Chief Special Agent.

General W. A. KNAPP,
Chief Clerk Post-Office Department.

No. 1 c.

POST-OFFICE DEPARTMENT, TOPOGRAPHER'S OFFICE,
Washington, D. C., September 12, 1879.

SIR: I have the honor to submit, for insertion in the estimates of appropriations required for the fiscal year ending June 30, 1881, this item, with the usual attached clause authorizing the sale of maps:

For preparation and publication of post-route maps, and miscellaneous expenses of topographer's office, including revision of former editions, and furnishing maps, diagrams, and other information, fifty thousand dollars (\$50,000); and the Postmaster-General may authorize the publication and sale of said maps to individuals at the cost thereof, the proceeds of said sales to be applied as a further appropriation for said purpose.

The sum above estimated will cover the salaries of draughtsmen employed on current and on new work; the engraving, lithographing, and photo-lithographing; the printing, coloring, mounting, and backing maps; the purchase of copper-plates, lithographic-stones, map-paper, and other materials used; the purchase of technical books, atlases, and maps for reference; the payment of clerical force, and other incidentals.

By "current work" is to be understood that which forms by far the greater part of the duties of the employés (draughtsmen and clerks) of this office, namely, the keeping up the working maps and diagrams in daily use for reference by the officers and clerks of the department, both those resident here and those in the field on duty.

This estimate is the same in amount as that I had the honor to present last year as being then necessary to meet the ever-increasing demands for the work of this office. But that estimate being reduced before submission from the department to the figures of the preceding year, in conformity with the requisition for all possible economy, the appropriation allowed was \$35,000, whereas during said preceding year there was not only allowed the sum of \$35,000, but an additional \$5,000 was granted in the general deficiency bill.

In view of the constantly-expanding nature of the work required from this office, much of which has been in past years delayed and even laid aside for want of adequate appropriations, and the desirability that its

maps should be much more widely disseminated among the postal employes, I earnestly hope that the moderate increase now applied for may be granted. The support of this office is in the interest of proper economy itself, to be derived from an intelligent study of the postal service represented on its maps.

The proceeds of sales of maps during the fiscal year ending June 30, 1879, were \$1,097.75.

This amount, deposited in the United States Treasury, was drawn upon and used "as a further appropriation" in the "preparation and publication of post-route maps," as allowed by the law, act June 17, 1878.

Very respectfully,

W. L. NICHOLSON,
Topographer Post-Office Department.

W. A. KNAPP, Esq.,
Chief Clerk to the Postmaster-General.

No. 1 d.

POST-OFFICE DEPARTMENT,
OFFICE OF THE FIRST ASSISTANT POSTMASTER-GENERAL,
Washington, D. C., October 1, 1879.

SIR: Agreeably to your request, I submit herewith estimates of the appropriations necessary for the fiscal year ending June 30, 1881, under the following heads, viz:

For compensation to postmasters	\$7, 550, 000
For clerks in post-offices	3, 650, 000
For letter-carriers	2, 500, 000
For wrapping-paper	20, 000
For wrapping-twine	50, 000
For marking and rating stamps	15, 000
For letter-balances, scales, and test weights	10, 000
For rent, fuel, and light	450, 000
For office furniture	20, 000
For stationery	50, 000
For miscellaneous items	90, 000
	<hr/>
	14, 405, 000

The total amount appropriated for the above items for the fiscal year ending June 30, 1880, is \$14,235,500, and the total amount estimated for above (\$14,405,000) is, therefore, but \$169,500 in excess of the appropriation for the current fiscal year.

The estimate for each item, except that for letter-balances, scales, and test weights, is made solely with a view to meet the rapid expansion of the service, and is not considered excessive in any particular. The necessity for the purchase of test weights, to be used in determining the exactness of the scales in the different post-offices, together with the increase in the contract price of the ordinary letter-balance, has made necessary an estimate for this item of \$10,000, which is \$6,500 more than the appropriation for the same for the present fiscal year.

In connection with the above estimates will be found a table, marked A, giving further information upon the subject.

Very respectfully, &c.,

JAMES H. MARR,
Acting First Assistant Postmaster-General.

Hon. A. D. HAZEN,
Third Assistant Postmaster-General.

No. 1c.—Statement showing the increase or decrease per centum, for the items named below, of the appropriations for the fiscal years ending June 30, 1879, and June 30, 1880, as compared with the estimates for the fiscal year ending June 30, 1881; also the increase or decrease per centum, for the same items, of the expenditures for the fiscal year ending June 30, 1879, as compared with the estimates for the fiscal year ending June 30, 1881.

Items.	Appropriation for the fiscal year ending June 30, 1879.	Estimate for the fiscal year ending June 30, 1881.	Per centum of increase or decrease of estimates for 1880-'81 over appropriations for 1878-'79.		Appropriation for the fiscal year ending June 30, 1880.	Estimate for the fiscal year ending June 30, 1881.	Per centum of increase or decrease of estimates for 1880-'81 over appropriations for 1878-'79.		Expended during the fiscal year ending June 30, 1879.	Per centum of increase or decrease of estimates for 1880-'81 over expenditures for 1878-'79.	
			Increase.	Decrease.			Increase.	Decrease.		Increase.	Decrease.
For compensation to postmasters.....	\$7,250,000	\$7,550,000	4.13	.....	\$7,550,000	\$7,550,000	.....	.....	\$7,182,239 27	5.12	.....
For clerks in post-offices.....	3,405,000	3,650,000	5.33	.....	3,600,000	3,650,000	1.38	.....	3,413,205 80	6.94	.....
For letter-carriers.....	*1,946,000	2,500,000	28.46	.....	12,415,000	2,500,000	3.51	.....	1,947,706 61	28.35	.....
For wrapping-paper.....	20,000	20,000	.....	.....	20,000	20,000	.....	.....	18,877 71	5.94	.....
For wrapping-twine.....	45,000	50,000	11.11	.....	50,000	50,000	.....	.....	45,375 89	10.19	.....
For marking and rating stamps.....	12,000	15,000	25	.....	12,000	15,000	25	.....	11,997 45	26.7	.....
For letter-balances, scales, and testweights.....	3,500	10,000	185.71	.....	3,500	10,000	185.71	.....	3,501 25	185.61	.....
For rent, fuel, and light.....	380,000	450,000	18.42	.....	425,000	450,000	5.88	.....	364,093 87	23.62	.....
For office furniture.....	20,000	20,000	.....	.....	20,000	20,000	.....	.....	11,375 51	75.81	.....
For stationery.....	50,000	50,000	.....	.....	50,000	50,000	.....	.....	43,420 56	15.17	.....
For miscellaneous and incidental items.....	80,000	90,000	12.5	.....	90,000	90,000	.....	.....	75,890 51	18.71	.....
	13,271,500	14,405,000	8.54	.....	14,235,500	14,405,000	1.18	.....	13,117,774 53	9.81	.....
* Act of June 17, 1878.....											
Act of June 28, 1879.....	\$1,875,000										\$2,000,000
	71,000										415,000
											2,415,000

No. 1 *f*.POST-OFFICE DEPARTMENT,
OFFICE OF THE SECOND ASSISTANT POSTMASTER-GENERAL,
Washington, D. C., November 10, 1879.

SIR: I have the honor to submit an estimate of the amount necessary to be appropriated to cover the cost of the various items of expense incident to this office for the fiscal year ending June 30, 1881.

The amount required is \$24,125,000, made up as follows, viz: For transportation by railroad routes, \$10,000,000, this sum being \$1,000,000 more than the \$9,000,000 appropriated for the current fiscal year.

This increase is believed to be necessary because of the rapid extension of the railroad system, the amount of which, from present indications, for the year ending June 30, 1881, will be more than 4,000 miles; and, too, for the reason that the volume of mail-matter is increasing in consequence of the superior arrangements for its safety in transit, and other changes that have served to make postal service more useful to the public than it has been in the past. In comparing this estimate with the cost on the 30th June, 1879, consideration must be given to the fact that the pay for that year for the weight of mails was decreased \$400,000 by the act of June 17, 1878, requiring a deduction of 5 per centum to be made from the pay for weight of mails.

The appropriation for railway post-office-car service, made a separate item for the first time for the fiscal year ending June 30, 1880, is \$1,250,000, and the estimate therefor for 1881 is set down at \$1,350,000, which is \$100,000 over the appropriation for the current fiscal year. The amount asked for is small compared with the pressure existing for the extension of this service; but as the Postmaster-General can control the expenditure in this direction, the estimate is placed at a sum that it is believed will cover the additional service for which there may be the most urgent need.

The estimate for a fund for proper facilities on trunk lines is placed at \$400,000, or \$250,000 above the \$150,000 appropriated for that object for the current fiscal year. The use of this fund has secured facilities of great moment to the public; but as the amount provided has been small, the special benefits have been correspondingly limited. And the present state of values renders the use of such a fund more reasonable and necessary than it has been in past years.

The amount appropriated for service on steamboat routes for the year ending June 30, 1880, is \$900,000, and the same amount will probably be sufficient for the year ending June 30, 1881.

The appropriation for service on star routes for 1880 is \$5,900,000. The estimate for 1881, \$7,375,000. This increase is asked for because the service in the Southern States and in Indiana and Ohio is to be let for a new contract term of four years, commencing on the first of July, 1880, and in the advertisement inviting proposals for the service, now in the hands of the printer, a general improvement in this service is contemplated; and for the greater reason that the low rates for carrying the mails on star routes which have obtained for several years cannot possibly be continued under the present advance in the cost of every item that contributes to the expense of performing the service.

The appropriation for railway post-office clerks for 1880 is \$1,350,000. The estimate for 1881 is \$1,450,000.

The increase in this item, in addition to the usual reason of the ordinary development of the service, is to enable the department to place railway

post-office clerks in charge of service on the new through lines from Richmond to Charleston, Savannah, and Jacksonville; and from Richmond, via Danville and Charlotte, to New Orleans, as is the case in other parts of the country.

The appropriation for route-agents for 1880 is \$1,125,000. The estimate for 1881 is \$1,225,000. The increase in this item is called for by the increase in the work to be done on the old lines, and for the care of the mails on new roads.

The appropriation for mail-route messengers for 1880 is \$175,000; the estimate for 1881, \$200,000.

The appropriation for local agents for 1880 is \$120,000; the estimate for 1881, \$150,000.

The appropriation for mail messengers for 1880 is \$675,000; the estimate for 1881 is \$725,000.

This service increases with the service established on new railroads, to which reference has already been made.

The appropriation for mail locks and keys for 1880 is \$15,000; the estimate for 1881 is \$150,000.

The appropriation for 1880 is only for the ordinary wear and breakage of locks and keys; the locks and keys now in use are well worn, and the estimate of \$150,000 is with the view of substituting for these old locks and keys, new ones of improved pattern.

The appropriation for mail-bags and mail-bag catchers for 1880 \$185,000; the estimate for 1881 is \$200,000.

Very respectfully, &c.,

THOS. J. BRADY,
Second Assistant Postmaster-General.

Hon. A. D. HAZEN,
Third Assistant Postmaster-General.

No. 19.—*Cost of inland transportation, and the items incident thereto, for the years 1878 and 1879, with the appropriations for 1880 and the estimates of the amounts necessary to be appropriated for 1881, showing the percentage of increase and decrease, with the cost, appropriation, and estimate for mail locks and keys, mail-bags and mail-bag catchers.*

Object.	Cost for 1878.	Cost for 1879.	Per centum in- crease or decrease of 1879 as to 1878.		Appropriation for 1880.	Per centum in- crease or decrease of appropriation of 1880 as to cost of 1879.		Estimate for 1881.	Per centum in- crease or decrease as to appropria- tion for 1880.	
			Increase.	Decrease.		Increase.	Decrease.		Increase.	Decrease.
Inland transportation, railroad routes.	\$9,566,585 00	\$9,567,589 00	.009		\$9,000,000 00		4.36	\$10,000,000 00		11.11
Railway post-office car service.					1,250,000 00			1,350,000 00		8.00
For proper facilities on trunk lines.					150,000 00			400,000 00		166.67
Inland transportation, steamboat routes.					900,000 00		19.30	900,000 00		
Inland transportation, star routes.	752,483 00	754,390 00	.25		5,900,000 00		9.11	7,375,000 00		25.00
Railway post-office clerks.	5,714,943 00	6,491,700 00	13.59		1,350,000 00		5.52	1,450,000 00		7.40
Route-agents.	1,260,590 00	1,272,200 00	.9		1,125,000 00		49.00	1,225,000 00		8.86
Mail-route messengers.	1,045,980 00	1,072,420 00	2.52		1,175,000 00		4.38	200,000 00		14.28
Local agents.	162,066 00	167,649 00	3.43		120,000 00		6.63	150,000 00		25.00
Mail-messengers.	105,530 00	112,531 00	6.63		675,000 00		1.54	725,000 00		7.40
Mail locks and keys.	659,497 00	664,173 92	.7		15,000 00		17.37	150,000 00		900.00
Mail-bags and mail-bag catchers.	13,475 00	12,780 55	5.15		185,000 00		8.65	200,000 00		8.10
	166,641 29	170,266 26	2.79							
Total.					20,845,000 00			24,125,000 00		15.73

NOTE.—The above estimates are based upon the contract prices and annual salaries, without reference to fines and deductions. This will explain the apparent discrepancy between this table and the Auditor's statement.

THOS. J. BRADY,
Second Assistant Postmaster-General.

No. 1 h.

Explanation of estimates of appropriations for the Office of the Third Assistant Postmaster-General.

I.—ADHESIVE POSTAGE-STAMPS.

For manufacture of ordinary postage-stamps, of official stamps, of newspaper and periodical stamps, and of postage-due stamps	\$97,000 00
The number of ordinary postage-stamps and of postage-due stamps issued during the fiscal year ending June 30, 1879, was	790,026,330
Add 10 per cent. for increase	79,002,633
Gives estimated issue for fiscal year ending June 30, 1880	869,029,015
Add 10 per cent. for increase, as before	86,902,901
Gives estimated issue for fiscal year ending June 30, 1881	955,931,919
Cost of manufacturing that number at present contract price, 9.98 cents per thousand	\$95,402 00
Add estimated cost of manufacturing official and newspaper and periodical stamps	2,000 00
Gives estimated total cost of manufacturing adhesive stamps during the fiscal year ending June 30, 1881	97,402 00

In the foregoing calculation it is assumed that the rate of increase in the issue of stamps for the next two years will be 10 per cent., which is greater than the actual rate of increase of the present over the past year. It is not considered safe, however, to depend entirely upon past rates for future wants. A general return to business prosperity throughout the country, the coming Presidential election, and other causes may tend to vastly increase postal issues. It must be considered, too, that large numbers of postage-due stamps, provided by law for the collection of short-paid postages, must be manufactured, which will be additional to the customary issues for previous years.

The cost of manufacturing official and newspaper stamps during the past year was \$1,810.23. For the next year it is not unreasonable to expect a small increase; the estimate is therefore fixed at \$2,000, which is \$500 less than the estimate made last year. The whole estimate in even numbers may be put at \$97,000.

The contract for manufacturing postage-stamps will end on the 1st of May, 1881, two months before the expiration of the fiscal year; but it is expected that the price of manufacture under a new contract will be quite as reasonable as those under the present.

II.—POSTAGE-STAMP AGENCY.

For pay of agent and assistants to distribute stamps, and for expenses of the agency	\$3,100 00
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This amount is the same as the existing appropriation, which is barely enough to pay the salaries of the agent and his assistants, and the necessary expenses of the agency.

III.—STAMPED ENVELOPES AND WRAPPERS.

For manufacture of stamped envelopes and newspaper wrappers	\$437,000 00
The cost of manufacturing stamped envelopes (not including official stamped envelopes) during the fiscal year ending June 30, 1879, was ..	361,375 51
Add 10 per cent. for estimated increase	36,137 53
Gives estimated cost for fiscal year ending June 30, 1880	397,513 06
Add 10 per cent. for increase, as before	39,751 30
Gives estimated cost for fiscal year ending June 30, 1881	437,264 36

The same rate of increase is assumed in this calculation as in that of the estimate for postage-stamps, and similar reasons exist for believing it to be a reasonable one. The estimate may be fixed in even numbers at \$437,000, which is \$52,000 less than the present appropriation. It is considered not unsafe to put the estimate at this reduced amount, inasmuch as the issue of official stamped envelopes, the cost of which has heretofore been paid out of the item of appropriation for the manufacture of stamped envelopes, has been almost discontinued on account of the substitution under the law of free post-office envelopes. The issue of post-office envelopes will of course be correspondingly increased.

IV.—STAMPED-ENVELOPE AGENCY.

For pay of agent and assistants to distribute stamped envelopes and newspaper wrappers and for expenses of the agency \$16,000 00

This estimate agrees with the present appropriation, which is just sufficient to cover actual expenses.

V.—POSTAL CARDS.

For manufacture of postal cards \$211,000 00

The number of postal cards issued during the fiscal year ending June 30, 1879, was 221,807,000
Add 17 per cent., for increase..... 37,707,190

Gives estimated issue for fiscal year ending June 30, 1880 259,514,190
Add 17 per cent. for increase as before..... 44,117,412

Gives estimated issue for fiscal year ending June 30, 1881 303,631,602

Cost of manufacturing that number at present contract price of 69.56 cents per thousand \$211,206 14

As in the case of postage-stamps and stamped envelopes, the rate of increase fixed above is somewhat greater than the actual rate of increase during the past year; the average increase, however, during the last five years has been more than that now assumed, and there is no reason for supposing that during the next two years it will be materially less. The present contract will not expire until the close of the fiscal year ending June 30, 1881, so that no increase of price is to be expected. The estimate is put in even figures at \$211,000.

VI.—POSTAL-CARD AGENCY.

For pay of agent and assistants to distribute postal cards and for expenses of the agency..... \$7,300 00

This estimate agrees with the present appropriation and is intended to provide for only the necessities of the agency.

VII.—REGISTERED-PACKAGE ENVELOPES, LOCKS AND SEALS, AND POST-OFFICE AND DEAD-LETTER ENVELOPES.

For registered-package envelopes, locks and seals, and for post-office and dead-letter envelopes..... \$100,000 00

This estimate is just \$35,000 greater than the existing appropriation. It is absolutely necessary to make it so for the following reason: Heretofore the cost of manufacturing official stamped envelopes has been borne out of the appropriation for stamped envelopes and newspaper wrappers. Now, under the law providing for the use of free envelopes, the issue of official stamped envelopes has ceased, and the cost of the free envelopes used in their stead must be borne out of the appropriation for post-office envelopes. As the cost of manufacturing official stamped

envelopes during the ten months of the last fiscal year (during which time they were issued) amounted to \$37,196.63, it will be seen that the present estimate is not any too great. It is to be remembered, too, that since the admission of third-class matter to the privileges of registration the use of registered-package envelopes has largely increased and is still increasing. The popularity of this feature of the registry system is so great that there can be no doubt of a considerable increase in the issue of registered-package envelopes during the coming two years, which, of course, is considered in the present estimate.

VIII.—SHIP, STEAMBOAT, AND WAY LETTERS.

For ship, steamboat, and way letters \$4,500 00

By law (sections 3913, 3976, 3977, 3978, Revised Statutes) this appropriation is necessary for the payment to masters or owners of vessels not regularly engaged in transporting the mails, for letters brought and delivered to post-offices on arrival in port for transmission to destination. The parties receiving the letters are required to pay, in addition to the regular postage, the amounts paid to said masters or owners, which amounts are consequently refunded to the department. The current appropriation is \$4,500.

IX.—ENGRAVING, PRINTING, AND BINDING DRAFTS AND WARRANTS.

For engraving, printing, and binding drafts and warrants..... \$1,500 00

This amount is for the blank drafts and warrants used in paying contractors and others, and is the same as the current appropriation.

Comparison of estimates with present appropriations.

Items.	Estimate for fiscal year ending June 30, 1881.	Appropriations for fiscal year ending June 30, 1880.	Increase of estimate—amount.
For manufacture of ordinary and postage-due stamps, of official and of newspaper and periodical stamps	\$97,000	\$92,000	\$5,000
For pay of agent and assistants to distribute stamps and expenses of the agency	8,100	8,100	.....
For manufacture of stamped envelopes and newspaper-wrappers	437,000	490,000	*53,000
For pay of agent and assistants to distribute stamped envelopes and newspaper-wrappers and expenses of the agency	16,000	16,000	.....
For manufacture of postal cards	211,000	200,000	11,000
For pay of agent and assistants to distribute postal cards, and expenses of the agency	7,300	7,300	.....
For registered-package envelopes, locks and seals, and for post-office and dead-letter envelopes	100,000	65,000	35,000
For ship, steamboat, and way letters	4,500	4,500	.....
For engraving, printing, and binding drafts and warrants	1,500	1,500	.....
Totals.....	882,400	884,400	*2,000

* Decrease.

It will be seen from the above table that while on some of the items of estimates there is an increase over existing appropriations, on the whole there is a decrease of \$2,000.

A. D. HAZEN,
Third Assistant Postmaster-General.

No. 1 i.

POST-OFFICE DEPARTMENT,
OFFICE OF FOREIGN MAILS,
Washington, D. C., September 9, 1879.

SIR: I transmit herewith, agreeably to the request made in your letter of the 25th ultimo, an estimate of the amounts required to be appropriated for the foreign mail service during the fiscal year ending June 30, 1881, as follows, viz:

For foreign mail transportation	\$225,000
For balances due foreign countries, including the United States portion of the expenses of the International Bureau of the Universal Postal Union.	45,000

I am, very respectfully, your obedient servant,
JOSEPH H. BLACKFAN,
Superintendent of Foreign Mails.

Hon. A. D. HAZEN,
Third Assistant Postmaster-General.

No. 1 k.

POST-OFFICE DEPARTMENT,
OFFICE OF SUPERINTENDENT OF MONEY-ORDER SYSTEM,
Washington, D. C., October 4, 1879.

SIR: In compliance with the request made in your letter of to-day, I have the honor to inform you that the revenue to be derived from the money-order business for the fiscal year ending June 30, 1881, will, in my opinion, amount to two hundred and ten thousand dollars (\$210,000).

I am, respectfully, your obedient servant,
D. HAYNES,
Acting Superintendent.

Hon. A. D. HAZEN,
Third Assistant Postmaster-General.

No. 2.—Statement showing appropriations for the fiscal year ended June 30, 1879, and the expenditures made, by items, up to September 30, 1879, out of said appropriations.

Title of appropriations.	Amount of appropriation, including special acts.	Expended.	Balance unexpended.	Excess of expenditures.
Compensation of postmasters	\$7,250,000 00	\$7,182,239 27	\$67,760 73	.....
Compensation of clerks for post-offices	2,465,000 00	8,413,295 90	51,704 10	.....
Compensation of letter-carriers and incidental expenses	1,946,000 00	1,947,706 61	\$1,706 61	.....
Wrapping paper	20,000 00	18,877 71	1,122 29	.....
Twine	45,000 00	45,375 89	375 89	.....
Postmarking and cancelling stamps	12,000 00	11,997 45	2 55	.....
Letter-balances	3,500 00	8,501 25	15,006 13	.....
Rent, light and fuel for post-offices	380,000 00	864,093 87	6,579 44	.....
Stationery	50,000 00	43,420 56	8,624 49	.....
Furniture for post-offices	20,000 00	11,375 51	4,109 49	.....
Miscellaneous, Office of First Assistant Postmaster-General	80,000 00	75,890 51	4,409 49	.....
Inland mail transportation, railroad	20,000 00	9,100,706 67	449,293 33	.....
Inland mail transportation, steamboat	9,550,000 00	5,587,245 28	34,892 16	.....
Compensation of railway post-office clerks	5,390,673 00	6,655,107 84	144,573 28	.....
Compensation of route-agents	700,000 00	1,341,394 14	34,605 86	.....
Compensation of mail-route messengers	1,342,000 00	1,035,861 91	638 09	.....
Compensation of local agents	1,036,500 00	171,241 32	241 32	.....
Compensation of mail-messengers	171,000 00	116,177 88	322 12	.....
Compensation of local agents	116,500 00	658,874 04	18,125 06	.....
Mail boxes and keys	675,000 00	13,180 55	1,819 45	.....
Mail bags and catches	15,000 00	130,614 86	48,865 14	.....
Post-route maps	185,000 00	41,097 75	53	.....
Mail depredations and special agents, including rewards, and fees to United States marshals, attorneys, clerks of courts, and counsel	41,097 75	145,122 64	4,877 36	.....
Postage-stamps	150,000 00	78,534 86	1,465 12	.....
Distribution of postage-stamps	80,000 00	7,503 54	596 46	.....
Stamped envelopes and newspaper wrappers	8,100 00	402,152 64	67,847 30	.....
Distribution of stamped envelopes and newspaper wrappers	470,000 00	15,239 37	740 63	.....
Postal cards	15,000 00	154,281 90	15,718 04	.....
Distribution of postal cards	170,000 00	5,713 58	840 45	.....
Postage for large envelopes, books and mail	6,100 00	18,250 83	21,740 17	.....
Postage for small envelopes	40,000 00	29,792 83	4,792 80	.....
Postage for small letters	25,000 00	1,860 40	4,110 67	.....
Postage for small parcels	1,000 00	1,860 40	4,110 67	.....

Advertising	60,000 00	25,354 25	34,645 75	.....
Miscellaneous, Office of Postmaster-General	1,500 00	1,453 82	47 18	.....
Foreign mail transportation	240,000 00	203,817 03	36,082 97	.....
Balance due foreign countries	40,000 00	31,832 72	8,167 28	.....
Laws and regulations Post-Office Department, edition of 1879	20,000 00	18,202 51	1,797 49	.....
Total	83,828,470 75	33,073,437 82	908,722 08	153,690 15

Deducting excess of expenditures (\$153,690.15) from the above "balance unexpended" (\$908,722.08), the actual balance of unexpended appropriations will be \$755,032.93.

A. D. HAZEN,

Third Assistant Postmaster-General.

OFFICE OF THIRD ASSISTANT POSTMASTER-GENERAL,
DIVISION OF FINANCE, November 1, 1879.

No. 3.—Statement exhibiting receipts and expenditures, under appropriate heads, by quarters

RECEIPTS.

	Quarter ended September 30, 1878.	Quarter ended December 31, 1878.	Quarter ended March 31, 1879.	Quarter ended June 30, 1879.
Letter-postage paid in money.....	\$58,898 42	\$53,571 14	\$75,710 61	\$68,721 24
Box-rents and branch offices.....	348,692 04	343,349 83	345,496 55	345,622 09
Fines and penalties.....	3,789 04	1,107 39	1,605 34	2,578 35
Postage-stamps, stamped envelopes, news- paper-wrappers, and postal cards.....	6,642,842 02	6,961,539 49	7,500,809 29	7,039,884 19
Dead letters.....	957 30	675 95	514 53	1,275 61
Revenue from money-order business.....				219,236 88
Revenue from money-order business, inter- national, June 30, 1879.....				
Miscellaneous.....	6,864 17	4,058 25	5,929 77	12,361 42
	7,058,042 99	7,364,202 05	7,930,008 09	7,699,609 78

Comparison, including revenue from money-order business and official stamps:

Increase of receipts over year ended June 30, 1878, \$764,465.91, or 2.6+ per cent.

Increase of receipts over year ended June 30, 1877, \$2,510,397.60, or 8.3+ per cent.

EXPENDITURES.

Compensation of postmasters.....	1,721,338 22	1,775,548 89	1,853,762 50	1,831,589 06
Compensation of clerks for post-offices.....	837,757 95	844,975 78	856,069 60	874,472 57
Compensation of letter-carriers, and incident- al expenses.....	461,435 20	460,758 97	460,929 49	546,582 95
Wrapping-paper.....	4,259 00	3,278 00	3,731 43	7,609 28
Twine.....	9,486 00	12,570 00	11,050 60	12,269 29
Post-marking and canceling stamps.....	3,672 75	3,055 70	2,690 25	2,578 75
Letter-balances.....	1,541 00	35 25	296 00	1,629 00
Rent, light, and fuel for post-offices.....	86,523 61	97,722 83	80,090 80	90,747 54
Stationery.....	8,469 87	9,864 86	12,908 59	12,182 24
Furniture for post-offices.....	2,223 55	1,928 82	2,262 00	4,961 64
Miscellaneous—Office of First Assistant Postmaster-General.....	19,131 12	20,767 02	20,940 42	15,051 95
Inland mail transportation—railroad.....	2,325,608 11	2,363,447 68	2,162,235 85	2,249,415 03
Inland mail transportation—steamboat.....	161,145 38	167,058 67	153,809 04	163,024 73
Inland mail transportation—star.....	1,242,055 03	1,319,767 59	1,450,216 89	1,525,205 77
Compensation of railway post-office clerks.....	341,257 05	346,874 77	332,493 90	320,706 42
Compensation of route-agents.....	261,223 63	265,682 14	254,983 33	253,968 81
Compensation of mail-route messengers.....	40,235 72	42,572 46	45,961 06	42,452 66
Compensation of local agents.....	29,851 21	30,250 45	28,922 68	27,153 53
Compensation of mail-messengers.....	161,910 11	161,577 00	163,481 26	160,905 67
Mail-locks and keys.....		17 30	130 00	13,033 25
Mail-bags and catchers.....	82,702 66	24,355 12	80,968 20	48,568 88
Post-route maps.....	8,840 62	8,989 14		23,267 47
Mail depredations and special agents, includ- ing rewards.....	34,240 73	34,052 78	35,819 48	36,197 26
Postage-stamps.....	18,195 24	19,707 48	19,170 12	21,462 03
Distribution of postage-stamps.....	1,857 00	1,837 87	1,821 00	1,967 67
Stamped envelopes and newspaper-wrappers.....	107,874 88	105,150 72	116,064 29	72,432 73
Distribution of stamped envelopes and news- paper-wrappers.....	3,910 00	3,740 00	5,112 22	2,497 15
Postal cards.....	33,890 02	40,563 90	40,548 25	39,270 79
Distribution of postal cards.....	1,373 75	1,362 80	1,851 96	1,125 54
Registered-package envelopes, locks, and seals.....	1,635 00	4,479 90	7,151 64	4,903 29
Official envelopes for postmasters and dead- letter envelopes.....	3,341 40	4,261 85	4,893 59	17,285 96
Dead-letter envelopes.....				
Ship, steamboat, and way letters.....	514 10	522 28	273 82	410 22
Fees to United States marshals, attorneys, clerks of courts, and counsel.....	557 90	1,889 55	614 04	1,770 90
Engraving, printing, and binding drafts and warrants.....	239 70	283 80	437 10	
Advertising.....	4,651 73	3,982 82	5,347 40	11,372 30
Miscellaneous—Office of Postmaster-General.....	100 66	530 20	390 30	431 66
Foreign mail transportation.....	44,252 08	58,578 07	56,056 38	45,027 90
Balances due foreign countries.....	20 00	11,041 89	10,886 91	9,883 22
Laws and regulations, Post-Office Depart- ment, edition of 1879.....			1,155 77	17,046 74
Special commission on railroad transportation Delegates to International Postal Con- vention, Paris, France.....				
Official postal guides.....				
Subsidy—San Francisco, Japan and China line.....				
	8,017,331 58	8,262,063 35	8,254,377 28	8,530,665 61

RECEIPTS AND EXPENDITURES.

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for fiscal year ended June 30, '79, compared with fiscal years ended June 30, '78, and June 30, '77
RECEIPTS.

Total year ended June 30, 1879.	Total expenditures on account of previous fiscal years.	Total year ended June 30, 1878.	Compared with year ended June 30, 1878.		Total year ended June 30, 1877.	Compared with year ended June 30, 1877.	
			Increase.	Decrease.		Increase.	Decrease.
\$254,901 41		\$284,035 40		\$29,133 99	\$241,358 26	\$13,543 15	
1,381,162 51		1,358,448 39	\$22,714 12		1,321,968 08	59,194 43	
9,080 12		6,442 87	2,637 25		7,541 62	1,538 50	
28,145,074 99		27,375,593 12	769,481 87		25,757,515 76	2,387,559 23	
3,323 39		8,937 01	5,613 62		4,945 50	\$1,622 11	
219,226 83		209,647 89	9,578 94		109,148 01	110,078 82	
					63,261 84	63,261 84	
29,213 61		34,412 27	5,198 66		25,846 19	8,367 42	
30,041,982 86		29,277,516 95	804,412 18	39,946 27	27,531,585 26	2,575,281 55	64,883 95
29,277,516 95			39,946 27		30,041,982 86	64,883 95	
764,465 91			764,465 91		2,510,397 60	2,510,397 60	

Comparison, excluding revenue from money-order business and official stamps:
Increase of receipts over year ended June 30, 1878, \$671,703.27, or 2.3+ per cent.
Increase of receipts over year ended June 30, 1877, \$2,446,203.49, or 8.3+ per cent.

EXPENDITURES.

7,182,239 27	\$3,300 48	7,966,921 37		7,284,283 36	
3,413,295 90	3,825 90	3,325,498 02		3,233,151 60	
1,947,706 61		1,824,044 07		1,893,595 58	
18,877 71		16,509 00		17,207 50	
45,375 89		42,163 47		38,771 17	
11,997 45		8,999 85		9,994 98	
3,501 25	1,518 00	3,142 00		2,773 60	
364,983 87	497 02	376,898 85		373,694 54	
43,420 56	88 92	37,574 56		43,427 46	
11,375 51	10 00	10,717 92		7,067 09	
75,890 51	106 81	73,611 63		64,266 64	
9,100,706 67	276,306 11	9,324,139 09		8,701,033 11	
685,107 84					
5,537,245 28	44,957 60	6,400,671 69		5,839,647 34	
1,341,394 14	549 86	1,236,524 39		1,223,569 41	
1,035,861 91	1,292 57	996,254 82		959,690 86	
171,241 32	222 83	154,562 97		147,598 61	
116,177 88	125 00	109,291 64		105,718 70	
656,874 04	5,156 04	644,620 36		659,190 65	
13,180 55		890 00		15,387 50	
136,614 86	40	140,261 74		166,030 76	
41,097 23		30,855 80		20,666 58	
140,310 25	200 00	131,115 92		138,602 27	
78,534 88	300 00	76,037 35		110,189 59	
7,503 54		6,607 48		6,428 76	
402,152 64		474,131 64		428,224 63	
15,259 37	90 85	13,813 47		12,081 14	
154,281 96		132,579 56		226,463 94	
5,713 55	98 90	5,690 34		4,264 10	
18,259 83		23,224 25		35,878 04	
29,792 80		14,365 48		16,112 77	
1,820 43		1,774 80		513 30	
4,812 39		2,388 14		3,905 24	
860 60		3,883 93		2,659 02	
25,254 25	646 08	529 50		1,245 32	
1,452 82		15,854 54		22,831 15	
203,917 03	19,439 55	1,074 46		180 70	
31,832 72	17,728 71	207,683 70		213,534 76	
18,202 51		28,619 79		22,739 89	
		6,000 00			
		4,000 00			
				19,912 68	
				250,000 00	
33,073,437 82	376,461 63	33,874,647 59		32,322,504 24	

A. D. HAZEN, Third Assistant Postmaster General.

No. 4.—Receipts and disbursements at Treasury depositories

Depositories.	Increase over 1878.	Decrease from 1878.
Treasurer United States, Washington, D. C.....		\$189, 175 73
Assistant treasurer United States, Baltimore, Md.....		27, 534 13
Assistant treasurer United States, Boston, Mass.....		72, 643 08
Assistant treasurer United States, Chicago, Ill.....		88, 796 45
Assistant treasurer United States, Cincinnati, Ohio.....		108, 865 05
Assistant treasurer United States, New Orleans, La.....	\$91, 508 32	
Assistant treasurer United States, New York, N. Y.....	208, 470 84	
Assistant treasurer United States, Philadelphia, Pa.....	18, 034 08	
Assistant treasurer United States, San Francisco, Cal.....	13, 126 30	
Assistant treasurer United States, Saint Louis, Mo.....	52, 807 50	
First National Bank, Denver, Colo.....		
First National Bank, Galveston, Tex.....		
First National Bank, Leavenworth, Kans.....		
First National Bank, Madison, Wis.....		
First National Bank, Memphis, Tenn.....		
First National Bank, Milwaukee, Wis.....		
First National Bank, Nashville, Tenn.....		
First National Bank, Omaha, Nebr.....		
First National Bank, Portland, Oreg.....		
First National Bank, Providence, R. I.....		
First National Bank, Santa Fe, N. Mex.....		
First National Bank, Springfield, Ill.....		
First National Bank, Trenton, N. J.....		
First National Bank, Walla Walla, Wash.....		
First National Bank, Wilmington, Del.....		
First National Bank, Yankton, Dak.....		
Second National Bank, Detroit, Mich.....		
Second National Bank, Saint Paul, Minn.....		
Merchants' National Bank, Cleveland, Ohio.....		
Merchants' National Bank, Little Rock, Ark.....		
Merchants' National Bank, Portland, Me.....		
Merchants' National Bank, Savannah, Ga.....		
Atlanta National Bank, Atlanta, Ga.....		
Charter Oak National Bank, Hartford, Conn.....		
City National Bank, Grand Rapids, Mich.....		
Davenport National Bank, Davenport, Iowa.....		
Deseret National Bank, Salt Lake City, Utah.....		
East Tennessee National Bank, Knoxville, Tenn.....		
Exchange National Bank, Norfolk, Va.....		
Farmers and Mechanics' National Bank, Buffalo, N. Y.....		
Indianapolis National Bank, Indianapolis, Ind.....		
Kentucky National Bank, Louisville, Ky.....		
Lynchburg National Bank, Lynchburg, Va.....		
Nassau National Bank, Brooklyn, N. Y.....		
National Valley Bank, Staunton, Va.....		
Omaha National Bank, Omaha, Nebr.....		
Peoples' National Bank, Charleston, S. C.....		
Planters' National Bank, Richmond, Va.....		
Raleigh National Bank of North Carolina, Raleigh, N. C.....		
San Antonio National Bank, San Antonio, Tex.....		
Total.....	484, 847 13	485, 430 09 484, 847 13 13, 572 96

during the fiscal year ended June 30, 1879—Continued.

Transfer account.		Warrants paid.	Balance subject to draft June 30, 1879.	Outstanding warrants June 30, 1878.	Balance as per transcripts June 30, 1879.
From—	To—				
	\$1, 126, 955 11	\$1, 125, 997 42	\$98, 204 48	\$1, 465 34	\$99, 341 25
		158, 342 62	78, 367 99	391 90	78, 888 54
\$300, 000 00		333, 628 19	181, 932 69	233 74	181, 995 66
	500, 000 00	910, 288 06	80, 801 89	225 69	81, 340 25
	100, 000 00	279, 474 88	79, 967 05	6, 350 71	83, 055 50
	450, 000 00	497, 551 41	62, 543 11	3, 964 83	65, 897 76
2, 775, 000 00		4, 436, 210 87	1, 621, 705 10	13, 216 35	1, 640, 856 89
	100, 000 00	664, 632 21	124, 516 31	4, 329 33	124, 581 75
100, 000 00		353, 094 89	186, 217 87	9, 357 23	205, 126 32
	950, 000 00	1, 127, 602 93	86, 875 24	4, 108 41	92, 533 94
			4, 230 70		4, 230 70
253 08					
442 24					
168 00					
431 00					
615 75					
118 40					
336 00					
233 16					
23, 035 11			4, 949 11		4, 949 11
			298 50		298 50
5, 050 88					
200 00					
2, 381 78			2, 926 13		2, 926 13
551 28					
697 50			50 00		50 00
6, 706 34			620 68		620 68
25 00					
180 00					
1, 245 10			5 00		5 00
917 31					
861 00			5 00		5 00
			5, 589 22		5, 589 22
423 44					
1, 700 00					
824 71			85 00		85 00
100 00					
			214 29		214 29
289 43					
499 16					
			32	32	32
2, 126 46					
23 00			228 55		228 55
1, 500 00					
3, 226, 955 11	3, 226, 955 11	9, 896, 823 48	2, 620, 334 23	43, 646 15	2, 672, 818 36



Comparative statement between fiscal years of 1878 and 1879 at Treasury depositories.

Deposits for fiscal year of 1879	\$5,504,809 22	
Deposits for fiscal year of 1878	4,494,470 27	
Increase in deposits for 1879		1,100,339 05
Grants from the Treasury for 1878	\$6,128,870 02	
Grants from the Treasury for 1879	5,150,906 28	
Decrease in grants for 1879		977,963 74
Increase in deposits for 1879		1,100,339 05
Deduct increase of aggregate receipts for 1879		122,375 31
		<u>977,963 74</u>
Aggregate receipts for 1879	10,745,715 60	
Aggregate receipts for 1878	10,623,340 29	
Increase of aggregate receipts for 1879		<u>122,375 31</u>
Increase of receipts for 1879		1,238,587 35
Deduct decrease of receipts for 1879		138,191 30
Increase for 1879, as shown above		<u>1,100,396 05</u>
Warrants drawn for 1878	9,924,455 92	
Warrants drawn for 1879	9,910,882 06	
Decrease of warrants for 1879		488,429 00
Deduct increase of warrants for 1879		484,847 12
Decrease for 1879	13,572 96	<u>13,572 96</u>
Balance subject to draft June 30, 1879		2,620,234 22
Balance subject to draft June 30, 1878		1,790,280 00
Increase for 1879		<u>840,054 14</u>
Total number of warrants issued during fiscal year 1879		12,714
Total number of warrants issued during fiscal year 1878		11,816
Increase for 1879		<u>1,898</u>

A. D. HAZEN,
Third Assistant Postmaster-General

No. 5.—Receipts and disbursements at depository post-offices on account of the fiscal year ended June 30, 1879.

Offices.	State.	Proceeds.	Deposits.	Collections.	Aggregate accoun- tulations.	Amount subject to draft June 30, 1878.	Credit balances June 30, 1878.	Total.	Disbursements.	Amount subject to draft June 30, 1879.
Adrian.....	Michigan.....	\$5,728 02	\$137 03	\$235 43	\$5,891 48	\$1,016 53		\$7,808 05	\$5,106 50	\$2,611 56
Albany.....	New York.....	90,446 70	39,636 70	3,089 95	133,072 80	21,464 40		154,537 20	130,080 74	24,456 46
Albia.....	Iowa.....	1,622 72	235 21	131 50	2,059 43	280 41		2,339 84	1,685 16	654 68
Albion.....	Georgia.....	34,183 83	11,047 40	1,111 87	47,343 10		\$2,023 14	49,366 24	41,313 96	8,052 28
Auburn.....	New York.....	19,901 95	2,151 32	991 50	23,044 77	9,598 50		32,643 27	28,645 63	3,997 64
Augusta.....	Maine.....	42,616 64	4,569 49	2,177 73	47,363 86	1,232 54		48,606 41	42,688 50	5,917 91
Austin.....	Texas.....	16,018 79	4,270 45	1,785 02	23,064 26	1,868 34		24,932 60	21,180 14	3,752 46
Bangor.....	Maine.....	13,785 97	7,887 17	180 02	21,763 16	2,308 70		24,071 86	19,885 97	4,185 89
Barnes.....	New York.....	4,621 97	2,789 18		7,411 15			10,123 15	7,918 19	2,204 96
Bay City.....	Michigan.....	8,627 79	1,081 81	1,468 27	11,223 87	984 63		12,208 50	7,913 15	4,295 35
Birmingham.....	New York.....	18,890 43	7,980 03	243 27	26,432 73	8,653 23		35,085 96	28,924 41	6,215 55
Burlington.....	Vermont.....	13,175 73	920 79	53 56	15,521 08	3,653 63		19,174 71	12,687 94	6,486 77
Charleston.....	Illinois.....	1,478 81	3,042 78	24 50	1,524 81	664 03		2,188 84	1,743 16	455 68
Cincinnati.....	Ohio.....	34,535 31	18,342 08	571 49	53,448 88	2,015 58		55,464 46	34,673 18	20,791 28
Cleveland.....	Ohio.....	56,884 60	18,342 08	571 49	75,803 17	20,371 24		96,174 41	68,346 77	27,827 64
Columbus.....	Ohio.....	162,781 00	18,342 08	571 49	181,123 56	20,371 24		201,494 80	184,117 04	17,377 76
Concord.....	New Hampshire.....	18,682 59	20,585 91	269 13	39,527 63	11,923 16		51,450 79	39,609 03	11,841 76
Decorah.....	Iowa.....	3,528 62	409 66	319 47	4,258 75	2,335 04		6,593 79	5,211 97	1,381 82
Denver.....	Colorado.....	45,941 55	17,205 24	4,460 60	67,607 39	8,756 66		76,364 05	41,408 99	34,955 06
Des Moines.....	Iowa.....	31,540 35	9,197 85	974 18	41,712 38	7,756 66		49,469 04	35,368 52	14,100 52
Detroit.....	Michigan.....	22,409 92	32,497 85	62 05	54,909 83	23,633 94		78,543 77	55,039 19	23,504 58
East Saginaw.....	Michigan.....	10,892 82	1,725 45	45 40	12,618 29	3,623 79		16,242 08	10,431 23	5,810 85
Elmira.....	New York.....	18,013 97	4,811 76	81 80	23,007 53	1,624 28		24,631 81	20,432 24	4,199 57
Evansville.....	Indiana.....	18,439 21	2,426 00	173 87	20,995 08	1,894 79		22,889 87	18,202 24	4,687 63
Fort Dodge.....	Iowa.....	17,462 25	3,601 57	2 55	21,066 37	3,702 06		24,768 43	18,628 79	6,139 64
Fort Wayne.....	Indiana.....	35,230 15	10,446 95	45,677 10	81,354 00	5,146 60		86,499 60	41,560 00	44,939 60
Grand Rapids.....	Michigan.....	42,638 66	16,357 72	81,354 00	140,350 38	8,638 28		148,988 66	87,063 97	61,924 69
Harrisburg.....	Pennsylvania.....	75,702 84	25,462 39	111 81	101,367 04	12,139 95		113,506 99	106,117 93	7,389 06
Hartford.....	Connecticut.....	14,577 79	3,371 36	38 02	18,027 17	494 90	130 80	18,622 97	15,684 71	2,938 26
Houghton.....	Michigan.....	49,009 19	49,009 19	38 02	98,018 19			98,056 21	55,372 45	42,683 76
Houston.....	Texas.....	2,444 50	5,692 35	463 01	8,600 86	1,104 65		9,705 51	8,944 67	710 84
Huntsville.....	Alabama.....	87,062 86	5,395 31	630 26	93,558 43	5,815 85		99,374 28	88,542 51	10,831 77
Indianapolis.....	Indiana.....	7,755 35	7,755 35	2,324 53	10,080 88	15,035 83		25,116 71	11,294 48	13,822 23
Iowa City.....	Iowa.....	8,212 32	4,373 24	73 20	12,668 76	250 21		12,919 97	10,951 59	1,968 38
Jacksonville.....	Florida.....	7,851 76	1,289 39	24 63	9,165 78	3,672 28		12,838 06	8,507 78	4,330 28
Jamestown.....	New York.....	12,570 01	2,167 23	441 58	15,178 82	7,585 51		22,764 33	17,482 10	5,282 23
Kalamazoo.....	Michigan.....	5,888 79	2,658 93	1,273 63	9,821 34	4,349 71		14,171 05	10,747 05	3,424 20
Keene.....	New Hampshire.....									

No. 5.—Receipts and disbursements at depository post-offices, &c.—Continued.

Office.	State.	Proceeds.	Deposits.	Collections.	Aggregate accu- mulations.	Amount subject to draft June 30, 1878.	Credit balances June 30, 1878.	Total.	Disbursements.	Amount subject to draft June 30, 1878.
Keokuk.....	Iowa.....	\$13,194 64	204 06	.....	\$16,388 70	\$1,303 87	.....	\$17,732 57	\$14,556 30	\$3,086 27
Keokuk.....	Tennessee.....	12,574 76	2,619 61	.....	15,441 64	1,645 53	.....	17,107 17	14,885 70	2,221 47
Keokuk.....	Michigan.....	14,532 29	3,153 72	.....	17,673 92	2,725 51	.....	20,399 43	14,325 76	6,073 67
Keokuk.....	Leavenworth.....	16,791 17	61,537 38	2,317 51	79,641 26	9,565 51	.....	89,206 77	74,565 44	14,641 33
Keokuk.....	Kentucky.....	13,711 37	5,109 62	2,101 59	19,922 58	3,330 71	.....	23,253 29	18,535 72	4,717 57
Keokuk.....	Ohio.....	2,433 76	116 26	.....	8,127 18	3,330 71	.....	11,457 89	8,328 96	3,128 93
Keokuk.....	Kentucky.....	130,342 28	7,184 72	465 71	138,092 71	5,148 83	.....	143,241 54	137,916 69	5,324 85
Keokuk.....	Wisconsin.....	16,801 97	9,491 17	499 03	22,191 27	2,862 24	.....	25,053 51	21,402 27	3,651 24
Keokuk.....	New York.....	2,210 76	844 52	109 31	4,173 59	2,740 54	.....	6,914 13	5,996 47	917 66
Keokuk.....	Michigan.....	2,470 84	476 01	386 26	3,333 11	1,560 79	.....	4,893 90	4,405 74	488 16
Keokuk.....	Marquette.....	7,171 75	62 28	693 81	7,927 84	2,563 80	.....	10,515 64	7,725 91	2,789 73
Keokuk.....	Marquette.....	9,118 10	40,601 95	230 58	50,010 63	2,204 05	.....	72,214 68	55,080 58	17,134 10
Keokuk.....	Tennessee.....	34,703 53	6,060 63	887 47	42,231 63	254 35	.....	42,525 98	38,499 89	4,026 09
Keokuk.....	Wisconsin.....	137,518 28	15,970 87	171 00	153,081 15	11,771 47	.....	164,852 62	143,108 31	22,323 31
Keokuk.....	Alabama.....	23,766 22	7,255 81	223 81	31,245 84	4,206 84	.....	35,452 68	34,408 03	1,044 65
Keokuk.....	do.....	9,018 30	9,896 35	691 31	19,004 96	.....	.....	19,004 96	16,792 11	2,212 85
Keokuk.....	Montpelier.....	5,694 40	4,149 93	.....	9,841 33	3,586 62	.....	13,427 95	9,567 35	3,860 60
Keokuk.....	do.....	3,861 11	236 45	700 00	4,797 56	1,749 39	.....	6,546 95	6,136 50	430 45
Keokuk.....	Tennessee.....	44,302 31	4,446 08	.....	48,748 39	3,725 89	.....	52,474 27	48,346 20	4,128 08
Keokuk.....	New Jersey.....	79,111 41	31,067 34	5,534 88	112,713 63	2,917 02	.....	115,630 65	81,830 80	33,799 85
Keokuk.....	Massachusetts.....	21,729 69	1,887 99	.....	23,617 68	9,084 38	.....	32,702 06	21,855 62	10,846 44
Keokuk.....	New Haven.....	66,745 45	46,128 39	1,579 25	113,453 09	15,440 70	.....	128,893 79	116,595 40	12,298 39
Keokuk.....	New York.....	3,618 06	1,817 40	180 64	5,626 10	3,920 65	.....	9,546 75	3,245 94	6,300 81
Keokuk.....	Ogleburgh.....	6,550 12	4,875 53	.....	11,425 65	2,310 65	.....	13,736 30	11,905 67	1,830 63
Keokuk.....	do.....	5,789 92	3,340 56	491 27	9,571 75	4,076 05	.....	13,647 80	7,943 43	5,704 37
Keokuk.....	Omaha.....	33,740 78	38,751 24	.....	78,442 17	1,163 14	.....	79,604 31	74,549 61	5,054 70
Keokuk.....	Peoria.....	31,423 39	2,285 28	452 40	34,161 07	6,250 96	.....	40,412 03	33,099 77	7,312 26
Keokuk.....	Pittsburgh.....	161,103 15	17,431 53	2,759 17	181,286 84	13,170 21	.....	194,468 05	176,115 52	18,352 53
Keokuk.....	New York.....	4,503 20	3,850 94	158 59	8,512 73	7,171 46	.....	15,684 19	12,026 60	3,657 59
Keokuk.....	Maine.....	57,490 86	18,249 72	.....	75,740 58	11,737 36	.....	87,477 94	81,076 62	6,401 32
Keokuk.....	New Hampshire.....	7,349 92	11,385 65	36 50	18,771 07	3,483 21	.....	22,254 28	13,516 96	8,737 32
Keokuk.....	Ohio.....	6,947 41	1,096 33	7 92	7,051 66	959 37	.....	8,011 03	6,518 52	1,492 51
Keokuk.....	Portsmouth.....	106,762 42	34,080 11	263 39	142,075 92	14,577 42	.....	156,653 34	112,966 87	43,686 47
Keokuk.....	Rhode Island.....	14,000 06	7,260 37	828 27	22,089 30	1,840 06	.....	23,929 36	21,252 02	2,677 34
Keokuk.....	North Carolina.....	59,582 67	10,500 18	1,097 38	71,240 23	4,061 61	.....	75,300 74	66,491 06	8,809 68
Keokuk.....	Virginia.....	99,704 45	34,751 87	2,170 74	136,626 06	14,459 13	.....	151,085 19	144,021 04	7,064 15
Keokuk.....	New York.....	6,673 25	1,134 30	207 80	12,034 35	2,764 96	.....	14,799 31	11,994 23	2,805 08
Keokuk.....	Rutland.....	.....	1,040 96	.....	6,539 48	1,101 31	.....	7,640 79	6,037 94	1,602 85
Keokuk.....	do.....	5,071 12	5,632 84	.....	8,008 50	2,540 37	.....	11,042 87	9,494 84	1,548 03

Saint Paul	55,697 50	17,928 30	180 87	73,806 48	3,653 82	77,460 28	67,756 27	9,703 91
Sandusky	9,281 27	1,638 03	.....	10,907 40	8,362 85	19,289 75	17,045 80	2,241 25
Savannah	27,581 99	2,593 89	757 69	30,843 87	1,980 84	32,412 51	30,079 86	2,733 65
Seranton	11,281 24	7,886 49	285 97	19,563 70	5,998 82	25,560 52	18,886 04	6,573 68
Springfield	20,573 71	1,184 60	568 38	22,306 64	1,870 71	24,177 35	17,845 09	6,531 66
Springfield	45,627 36	20,175 67	.....	65,868 03	14,538 56	80,861 39	75,886 71	4,464 86
Steuensville	7,461 15	1,145 42	.....	8,608 57	5,773 07	14,379 04	10,524 78	3,854 86
Syracuse	58,187 07	7,102 43	7,500 00	72,789 50	5,134 92	77,924 43	74,807 09	3,117 33
Tanniton	10,740 19	4,387 57	.....	15,127 76	8,049 64	23,777 40	20,780 00	2,997 40
Terre Haute	17,169 44	1,711 53	1,646 81	20,528 08	2,106 73	22,694 81	19,532 92	3,161 89
Towanda	3,535 59	3,184 44	15 19	6,725 22	1,949 38	8,674 60	7,286 82	1,377 78
Urbana	5,201 09	1,680 48	.....	6,831 57	5,524 92	11,756 49	8,490 17	3,266 32
Utica	89,010 02	12,968 99	100 00	62,088 01	10,719 66	62,807 66	45,416 68	17,390 86
Watertown	11,350 83	2,042 96	16 18	13,789 71	5,189 74	18,979 71	15,825 50	3,154 21
Wellsborough	1,926 78	1,042 53	5 51	2,974 82	1,957 91	4,982 73	3,865 96	1,566 77
Wheeling	21,042 58	8,090 64	.....	24,103 12	4,456 49	28,561 61	23,844 53	4,717 08
Williamspott	14,943 55	2,472 90	.....	16,130 65	4,818 99	22,949 64	18,941 64	4,008 00
Winona	7,290 28	12,142 08	75 66	19,508 03	4,819 79	24,327 82	19,227 32	5,100 50
Winona	6,093 01	1,166 10	618 39	7,876 50	2,386 57	10,213 07	7,624 70	2,388 37
Worcester	56,797 86	14,482 07	.....	71,279 43	17,309 29	88,588 72	64,471 01	24,117 71
Zanesville	10,517 31	3,062 68	231 95	13,811 94	5,652 58	19,464 52	15,332 61	4,131 91
Total	2,890,896 17	924,762 49	86,119 38	3,901,786 04	530,747 47	4,429,791 57	3,729,096 51	700,695 06

A. D. HAZEN,
Third Assistant Postmaster-General.

No. 6.—*Postage-stamps, stamped envelopes, newspaper-wrappers, and postal cards issued during the fiscal year ended June 30, 1879.*

ORDINARY POSTAGE-STAMPS.

Quarter ended—	NUMBER AND DENOMINATIONS OF STAMPS.									Value.
	1-cent.	2-cent.	3-cent.	5-cent.	6-cent.	10-cent.	15-cent.	30-cent.	90-cent.	
September 30, 1878.....	36,379,400	15,842,600	115,957,700	2,143,860	1,382,600	1,767,690	200,660	71,180	4,926	\$4,582,476
December 31, 1878.....	47,287,000	18,654,800	122,577,100	2,375,320	1,430,600	2,065,890	238,160	97,240	5,600	5,004,556
March 31, 1879.....	48,938,600	21,576,300	129,673,600	3,138,600	1,686,200	2,615,130	382,040	128,170	6,270	5,432,405
June 30, 1879.....	47,405,400	18,309,900	125,033,600	2,545,640	1,254,000	2,274,360	178,500	92,350	4,580	5,097,822
Total.....	180,030,400	74,383,600	493,854,000	10,203,620	5,753,400	8,723,090	1,000,360	382,940	21,370	20,117,259

NEWSPAPER AND PERIODICAL STAMPS.

Quarter ended—	NUMBER AND DENOMINATIONS OF STAMPS.												
	2-cent.	3-cent.	4-cent.	6-cent.	8-cent.	9-cent.	10-cent.	12-cent.	24-cent.	36-cent.	48-cent.	60-cent.	72-cent.
September 30, 1878.....	75,325	29,190	40,380	36,185	21,545	6,750	50,615	25,310	22,210	11,710	9,165	10,065	5,105
December 31, 1878.....	75,450	30,240	39,115	30,905	23,205	6,260	49,565	25,095	22,195	12,180	9,660	10,950	5,655
March 31, 1879.....	84,980	29,530	43,885	34,455	22,960	6,230	52,390	26,190	23,815	12,730	9,770	11,015	6,365
June 30, 1879.....	87,600	13,750	46,900	33,810	24,020	2,340	52,135	26,240	24,600	11,985	9,895	10,180	4,995
Total.....	323,365	102,690	169,780	135,355	91,650	21,580	204,705	102,835	92,820	48,605	38,490	42,210	22,120

Quarter ended—	NUMBER AND DENOMINATIONS OF STAMPS—Continued.											Value.
	84-cent.	96-cent.	\$1.92.	\$3.	\$6.	\$9.	\$12.	\$24.	\$36.	\$48.	\$60.	
September 30, 1878.....	4,545	12,820	6,775	6,566	3,142	1,962	2,131	836	663	455	1,148	\$235,823 30
December 31, 1878.....	3,825	8,825	6,065	5,931	2,558	1,756	1,570	695	320	274	1,277	224,577 20
March 31, 1879.....	5,105	11,360	7,113	7,583	3,034	2,416	2,819	1,231	781	528	1,107	328,343 10
June 30, 1879.....	5,465	11,240	6,408	6,662	2,983	1,680	1,752	840	346	190	1,068	246,667 90
Total.....	18,040	44,245	26,353	26,742	11,917	7,814	8,272	3,581	2,110	1,453	4,840	1,088,412 16

POSTAGE-DUE STAMPS.

Quarter ended—	NUMBER AND DENOMINATIONS OF STAMPS.				Value.
	1-cent.	2-cent.	3-cent.	5-cent.	
September 30, 1878 .....	.....	.....	.....	.....	.....
December 31, 1878 .....	.....	.....	.....	.....	.....
March 31, 1879 .....	.....	.....	.....	.....	.....
June 30, 1879	5,755,400	642,900	8,396,000	873,300	\$365,957
Total	5,755,400	642,900	8,396,000	873,300	365,957

ORDINARY STAMPED ENVELOPES AND WRAPPERS.

Quarter ended—	NUMBER AND DENOMINATIONS OF ENVELOPES.								NEWSPAPER WRAPPERS.		Value.
	1-cent.	2-cent.	3-cent.	5-cent.	6-cent.	10-cent.	15-cent.	90-cent.	1-cent.	2-cent.	
September 30, 1878	4,780,750	611,000	12,053,800	22,000	31,150	500	1,500	.....	5,886,250	462,500	\$576,178 82
December 31, 1878	3,357,750	440,000	7,976,600	2,250	24,350	100	600	.....	5,887,500	449,500	390,143 78
March 31, 1879	7,724,500	1,150,000	20,532,150	14,000	32,650	.....	2,550	100	8,141,500	673,000	884,297 45
June 30, 1879	5,382,500	838,000	14,801,600	31,350	53,700	.....	250	.....	7,580,500	677,250	663,016 77
Total	21,285,500	3,040,000	56,264,150	69,600	141,850	600	4,900	100	27,435,750	2,281,250	2,515,698 82

STAMPED ENVELOPES BEARING A REQUEST TO RETURN.

Quarter ended—	NUMBER AND DENOMINATIONS OF ENVELOPES.						Value.
	1-cent.	2-cent.	3-cent.	5-cent.	6-cent.	15-cent.	
September 30, 1878	422,500	510,000	14,998,500	7,000	42,000	.....	\$515,103 65
December 31, 1878	372,000	532,500	14,210,500	8,500	30,000	.....	488,123 20
March 31, 1879	516,000	662,000	17,609,500	7,500	40,500	1,000	594,835 25
June 30, 1879	382,500	690,500	15,955,250	8,500	65,500	.....	541,642 00
Total	1,693,000	2,385,000	62,774,750	26,500	178,000	1,000	2,139,704 10

No. 6.—Postage-stamps, stamped envelopes, newspaper-wrappers, and postal cards issued during the year ended June 30, 1879—Continued.

POSTAL CARDS.

	Quarter ending—	
	Number.	Amount.
September 30, 1878.....	48,733,500	\$487,335
December 31, 1878.....	58,315,000	583,150
March 31, 1879.....	58,292,500	582,925
June 30, 1879.....	56,454,000	564,540
Total.....	221,797,000	2,217,970

OFFICIAL POSTAGE-STAMPS.

Quarter ended—	NUMBER AND DENOMINATIONS OF STAMPS.										Value.
	1-cent.	2-cent.	3-cent.	6-cent.	7-cent.	10-cent.	12-cent.	15-cent.	24-cent.	30-cent.	90-cent.
September 30, 1878.....	120,150	291,250	5,646,500	721,850	3,400	65,500	129,150	72,185	13,925	77,935	52,550
December 31, 1878.....	24,800	31,200	1,799,700	51,750	.....	6,000	8,900	7,860	5,450	4,800	1,700
March 31, 1879.....	278,300	88,800	3,063,600	434,050	2,200	56,018	98,660	50,200	2,135	45,970	23,812
June 30, 1879.....	72,200	36,100	568,700	183,450	4,000	5,400	35,000	72,400	4,320	10,700	2,082
Total.....	505,550	445,850	11,018,500	1,361,100	9,600	134,918	272,710	201,865	32,790	138,795	80,144
											\$328,930 75
											64,827 00
											183,286 40
											49,975 80
											624,999 96

OFFICIAL STAMPED ENVELOPES.

Quarter ended—	NUMBER AND DENOMINATIONS OF ENVELOPES.				NEWSPAPER WRAPPERS.	Value.
	2-cent.		3-cent.	6-cent.	1-cent.	
September 30, 1878.....	268,750	3,588,200	3,180,660	71,500	650,000	\$124,673 60
December 31, 1878.....	238,500	3,180,660	4,803,000	50,900	900,000	110,161 50
March 31, 1879.....	257,500	4,803,000	2,568,700	106,100	800,000	187,843 00
June 30, 1879.....	184,500	2,568,700	13,840,500	329,350	3,550,000	677,823 00
Total.....	949,250	13,840,500	2,568,700	329,350	3,550,000	490,611 90

RECAPITULATION.

Articles.	Number.	Amount.
Ordinary postage-stamps	774,358,780	\$20,117,259 00
Newspaper and periodical stamps	1,552,172	1,088,412 16
Postage-due stamps	15,687,600	1,385,857 00
Ordinary stamped envelopes—plain	80,806,700	2,160,417 92
Ordinary stamped envelopes—request	67,058,250	2,139,704 10
Newspaper wrappers	29,687,000	2,355,218 00
Postal cards	221,797,000	2,217,870 00
Official postage-stamps	14,201,822	624,989 95
Official stamped envelopes and wrappers	17,209,150	469,011 90
Aggregate	1,222,948,474	29,538,950 93

A. D. HAZEN,
Third Assistant Postmaster-General.

No. 7.—*Postage-stamps, stamped envelopes, newspaper-wrappers, and postal cards issued during the fiscal year ending June 30, 1879.*

Description.	Quarter ended September 30, 1878.	Quarter ended December 31, 1878.	Quarter ended March 31, 1879.	Quarter ended June 30, 1879.	Total.
<i>Ordinary postage-stamps.</i>					
One-cent	36, 379, 400	47, 287, 000	48, 958, 600	47, 405, 400	180, 030, 400
Two-cent	15, 842, 600	18, 654, 800	21, 576, 300	18, 309, 900	74, 383, 600
Three-cent	115, 907, 700	122, 577, 100	129, 675, 600	125, 633, 600	493, 854, 000
Five-cent	2, 145, 800	2, 375, 320	3, 134, 800	2, 545, 640	10, 201, 560
Six-cent	1, 382, 600	1, 430, 800	1, 686, 200	1, 254, 000	5, 753, 600
Ten-cent	1, 767, 600	2, 065, 800	2, 615, 130	2, 274, 380	8, 723, 600
Fifteen-cent	200, 660	229, 160	382, 040	179, 500	1, 000, 360
Thirty-cent	71, 180	97, 240	128, 170	92, 350	389, 940
Ninety-cent	4, 920	5, 600	6, 270	4, 580	21, 370
Value	\$4, 582, 476 00	\$5, 004, 556 00	\$5, 432, 405 00	\$5, 097, 822 00	\$20, 117, 259 00
<i>Newspaper and periodical stamps.</i>					
Two-cent	75, 335	75, 450	84, 980	87, 600	323, 365
Three-cent	29, 190	30, 240	29, 530	13, 730	102, 690
Four-cent	40, 380	39, 115	43, 385	46, 900	169, 780
Six-cent	36, 182	30, 905	34, 455	83, 810	135, 353
Eight-cent	21, 545	23, 295	22, 990	24, 020	91, 850
Nine-cent	6, 750	6, 260	6, 230	2, 340	21, 580
Ten-cent	50, 615	49, 565	62, 390	52, 135	204, 705
Twelve-cent	25, 810	25, 095	26, 180	26, 240	103, 325
Twenty-four-cent	22, 210	22, 195	23, 815	24, 800	93, 020
Thirty-six-cent	11, 710	12, 180	12, 730	11, 985	48, 605
Forty-eight-cent	9, 165	9, 660	9, 770	9, 895	38, 490
Sixty-cent	10, 065	10, 950	11, 015	10, 180	42, 210
Seventy-two-cent	5, 105	5, 655	6, 365	4, 995	22, 120
Eighty-four-cent	4, 545	3, 825	5, 105	5, 485	18, 960
Ninety-six-cent	12, 820	8, 835	11, 350	11, 240	44, 245
One dollar and ninety-two cent.	6, 775	6, 035	7, 115	6, 408	26, 333
Three-dollar	6, 566	5, 931	7, 562	6, 062	26, 042
Six-dollar	3, 142	2, 558	3, 634	2, 583	11, 917
Nine-dollar	1, 962	1, 756	2, 416	1, 680	7, 814
Twelve-dollar	2, 131	1, 570	2, 819	1, 752	8, 272
Twenty-four-dollar	3, 836	1, 231	1, 231	649	3, 561
Thirty-six-dollar	663	320	781	346	2, 110
Forty-eight-dollar	455	274	528	196	1, 453
Sixty-dollar	1, 148	927	1, 167	1, 098	4, 340
Value	\$285, 823 30	\$228, 577 20	\$325, 343 70	\$248, 667 96	\$1, 088, 412 16
<i>Postage-due stamps.</i>					
One-cent				5, 755, 400	5, 755, 400
Two-cent				642, 900	642, 900
Three-cent				8, 396, 000	8, 396, 000
Five-cent				873, 300	873, 300
Value				\$365, 957 00	\$365, 957 00
<i>Ordinary stamped envelopes.</i>					
One-cent	4, 790, 750	3, 387, 750	7, 724, 500	5, 382, 500	21, 285, 500
Two-cent	611, 000	440, 000	1, 150, 000	839, 000	3, 040, 000
Three-cent	12, 953, 800	7, 976, 600	20, 532, 150	14, 801, 600	56, 264, 150
Five-cent	22, 000	2, 250	14, 000	31, 350	69, 600
Six-cent	31, 150	24, 350	32, 650	53, 700	141, 850
Ten-cent	500	100			600
Fifteen-cent	1, 500	600	2, 550	250	4, 900
Ninety-cent			100		100
One-cent wrappers	5, 869, 250	5, 867, 500	8, 141, 500	7, 580, 500	27, 459, 750
Two-cent wrappers	462, 500	449, 500	672, 000	677, 250	2, 261, 250
Value	\$576, 178 82	\$390, 143 78	\$886, 297 45	\$663, 016 77	\$2, 515, 636 82
<i>Stamped envelopes bearing a request to return.</i>					
One-cent	422, 500	372, 000	516, 000	382, 500	1, 693, 000
Two-cent	510, 000	532, 500	662, 000	680, 500	2, 385, 000
Three-cent	14, 999, 500	14, 210, 500	17, 609, 500	15, 955, 250	62, 774, 750
Five-cent	7, 000	3, 500	7, 500	8, 500	26, 500
Six-cent	42, 000	30, 000	40, 500	65, 500	178, 000
Fifteen-cent			1, 000		1, 000
Value	\$515, 103 65	\$488, 123 20	\$594, 835 25	\$541, 642 00	\$2, 139, 704 10

No. 7.—Postage-stamps, stamped envelopes, &c.—Continued.

Description.	Quarter ended September 30, 1878.	Quarter ended December 31, 1878.	Quarter ended March 31, 1879.	Quarter ended June 30, 1879.	Total.
<i>Postal cards.</i>					
One-cent	48, 733, 500	58, 315, 000	58, 292, 500	56, 456, 000	221, 797, 000
Value	\$487, 335 00	\$583, 150 00	\$582, 925 00	\$564, 580 00	\$2, 217, 970 00
<i>Official postage-stamps.</i>					
One-cent	130, 150	24, 900	278, 300	72, 200	505, 550
Two-cent	291, 250	31, 200	88, 300	35, 100	445, 850
Three-cent	5, 646, 500	1, 799, 700	3, 003, 600	588, 700	11, 018, 500
Six-cent	721, 850	51, 750	434, 050	153, 450	1, 361, 100
Seven-cent	3, 400		2, 200	4, 000	9, 600
Ten-cent	65, 500	6, 000	55, 018	8, 400	134, 918
Twelve-cent	129, 150	8, 900	99, 660	35, 000	272, 710
Fifteen-cent	72, 185	7, 080	50, 200	72, 400	201, 865
Twenty-four-cent	13, 925	5, 450	9, 165	4, 250	32, 790
Thirty-cent	77, 825	4, 300	45, 970	10, 700	138, 795
Ninety-cent	52, 550	1, 700	23, 812	2, 082	80, 144
Value	\$326, 930 75	\$64, 827 00	\$183, 266 40	\$49, 975 80	\$624, 999 95
<i>Official stamped envelopes.</i>					
Two-cent	268, 750	238, 500	257, 500	184, 500	949, 250
Three-cent	3, 588, 200	3, 180, 650	4, 303, 000	2, 308, 700	13, 380, 550
Six-cent	71, 500	50, 900	106, 100	100, 850	329, 350
One-cent wrappers	850, 000	600, 000	500, 000	800, 000	2, 550, 000
Value	\$124, 673 60	\$110, 161 50	\$146, 214 80	\$87, 962 00	\$469, 011 90

RECAPITULATION.

Description.	Number.	Value.
Ordinary postage-stamps	774, 358, 780	\$20, 117, 259 00
Newspaper and periodical stamps	1, 552, 172	1, 088, 412 16
Postage-due stamps	15, 667, 600	385, 957 00
Ordinary stamped envelopes, plain	80, 808, 700	2, 160, 417 92
Ordinary stamped envelopes, request	67, 038, 250	2, 139, 704 10
Total stamped envelopes	147, 846, 950	4, 300, 122 02
Newspaper-wrappers	29, 697, 000	355, 218 90
Postal cards	221, 797, 000	2, 217, 970 00
Official postage-stamps	14, 201, 822	624, 999 95
Official stamped envelopes	17, 209, 150	469, 011 90
Whole number and value of stamps, stamped envelopes, and wrappers	1, 222, 348, 474	29, 538, 950 93

A. D. HAZEN,
Third Assistant Postmaster-General.

No. 8.—*Postage-stamps, stamped envelopes, newspaper-wrappers, and postal cards issued during the fiscal year ending June 30, 1879.*

OFFICIAL POSTAGE-STAMPS.

Department.	Number and denomination of stamps.											Value.
	1-cent.	2-cent.	3-cent.	6-cent.	7-cent.	10-cent.	12-cent.	15-cent.	24-cent.	30-cent.	90-cent.	
Post-Office.....	28,650	13,550	8,324,300	181,050	.....	200	10,000	4,765	3,375	6,375	2,250	\$287,811 75
Treasury.....	200,000	250,000	1,400,000	500,000	.....	100,000	100,000	80,000	.....	80,000	70,000	200,000 00
Interior.....	25,400	31,000	1,337,000	60,000	.....	2,700	27,000	75,000	8,800	3,800	3,782	35,999 80
War.....	249,500	123,300	829,200	574,050	8,600	26,018	127,710	37,100	17,115	44,120	8,112	108,718 40
Navy.....	4,000	13,000	65,000	22,000	1,000	4,000	4,000	4,000	2,000	3,000	6,500	6,950 00
Agriculture.....	.....	5,000	40,000	10,000	.....	2,000	4,000	1,000	1,500	1,500	.....	1,900 00
Justice.....	.....	.....	23,000	14,000	.....	.....	.....	.....	.....	.....	500	3,620 00
Total.....	505,550	445,850	11,018,500	1,381,100	9,600	134,918	272,710	201,865	82,790	138,795	80,144	\$294,999 95

OFFICIAL STAMPED ENVELOPES.

Department.	Number and denominations of envelopes.			Newspaper-wrappers.	Value.
	2-cent.	3-cent.	6-cent.		
War.....	.....	.....	.....	1-cent.	.....
Post-Office.....	949,250	131,000	329,850	2,550,000	\$82,779 40
Total.....	949,250	13,880,550	829,850	2,550,000	436,282 50
	949,250	13,880,550	829,850	2,550,000	489,011 90

A. D. HAZEN,
Third Assistant Postmaster-General.

No. 9.—Table showing the increase in the issue of postage-stamps, stamped envelopes, newspaper-wrappers, and postal cards, including the issues for official use, for the fiscal year ending June 30, 1879, over those of the preceding year.

Articles issued.	1878.		1879.		Increase.		Per cent. increase.	
	Number.	Amount.	Number.	Amount.	Number.	Amount.	Number.	Amount.
Ordinary postage-stamps.....	742,461,940	\$19,468,618 00	774,358,780	\$20,117,259 00	31,896,840	\$648,641 00	4.29	3.33
Newspaper and periodical stamps.....	1,609,378	1,088,845 30	1,552,172	1,088,412 16	57,206	55,423 14	3.59	*.04
Ordinary stamped envelopes, plain.....	88,514,600	2,418,102 91	80,808,700	2,160,417 92	7,705,900	257,684 99	*8.47	*10.65
Ordinary stamped envelopes, request.....	67,845,250	2,183,025 25	97,038,250	2,138,704 10	2,987,000	45,321 15	*4.13	*1.98
Newspaper-wrappers.....	27,200,500	304,645 60	29,697,000	353,218 80	2,496,500	80,573 30	9.18	16.60
Postage-due stamps.....	.....	.....	15,667,600	365,857 00	15,667,600	365,857 00	.....	.....
Postal cards.....	200,630,000	2,006,300 00	221,797,000	2,217,970 00	21,167,000	211,670 00	10.55	10.55
Total issues for sale to the public.....	1,128,281,868	27,474,537 06	1,190,937,502	28,444,839 08	62,655,634	970,402 02	5.55	3.53
Add official postage-stamps.....	15,551,660	618,064 60	14,201,822	624,999 85	*1,349,838	6,905 35	*8.67	1.11
Add official stamped envelopes.....	16,783,125	474,553 10	17,209,150	469,011 90	426,025	*5,541 20	2.53	*1.16
Total of all issues.....	1,160,596,653	28,567,154 76	1,222,348,474	29,538,850 93	61,751,821	971,706 17	5.32	3.40

* Decrease.

A. D. HAZEN,
Third Assistant Postmaster-General.

No. 10.—Statement showing amount of dead mail-matter treated in the Division of Dead Letters during the fiscal year ended June 30, 1879.

CLASSIFICATION AND AMOUNT OF MAIL TREATED.		MODE OF TREATMENT.			
Class.	Amount.	Class.	Delivered unopened.	Opened.	On hand.
Domestic mailed letters: Unopened from last fiscal year.....	17,000	Domestic mailed letters	23,339	2,371,020	24,000
Received during the year.....	2,401,359				
Domestic unmailable letters: Held for postage.....	10,984	Domestic unmailable letters: Held for postage..... Containing unmailable articles..... Misdirected..... Blank.....	138,521	175,692	5,115
On hand from last fiscal year.....	306,344				
Received during the year.....	317,328				
Containing unmailable articles, received during the year.....	1,221				
Misdirected, received during the year.....	58,754				
Blank (without address), received during the year.....	7,944				
Domestic third and fourth class matter (packages) received during the year.....	385,247	Domestic third and fourth class matter.....		28,684	
Foreign matter: Letters on hand from last fiscal year.....	3,140				
Letters received during the year.....	153,390	Foreign matter: Letters..... Printed matter, samples, &c.....	151,578		4,954
Printed matter, samples, &c., returnable to country of origin, received during the year.....	7,693				
Total.....	2,506,513	Total.....	325,047	2,637,397	34,069

* Including—ordinary mail, 1,878,702; drop or local, 382,100; returned from hotels, 47,186; fictitious address, 17,544; returned from foreign countries (domestic origin), 91,121; ship and steamboat letters, brought by sea outside the mails, 1,518; and registered, 2,208.
 † Including—ordinary, 100,155; registered, 3,768.
 * Address corrected and letters forwarded.
 * Awaiting return of notice.

A. D. HAZEN,
 Third Assistant Postmaster-General.

LETTERS OPENED.		MANNER IN WHICH DISPOSED OF.									
Containing—		Number.	Value.	Containing—	Delivered.		Filed.		Outstanding.		Destroyed.
					Number.	Value.	Number.	Value.	Number.	Value.	Number.
Money:											
Outstanding from last fiscal year.....		2,920 = \$5,530 98									
Received during the year.....		16,007 = 31,561 49½		Money.....	13,291	\$27,156 11	2,772	\$3,863 70	2,864	\$3,102 64½	
Minors, (drafts, checks, notes, &c.):											
Outstanding from last fiscal year.....		291 = 20,557 28									
Received during the year.....		13,755 = 1,105,762 07									
Property (merchandise, books, &c.) received during the year.....		14,046	1,124,319 33	Minors.....	12,790	974,072 43	593	67,105 89	663	85,141 01	
Subminors (receipts, paid notes, &c.) received during the year.....		38,306		Property.....	18,276		20,030				
Photographs received during the year.....		24,372		Subminors.....	22,406		1,966				
Postage-stamps received during the year.....		24,024		Photographs.....	19,359		4,665				
Nothing of value.....		47,707		Postage-stamps.....	42,724		5,073				
		2,473,136		Nothing of value.....	726,245						*1,746,921
Total.....		2,640,008	1,163,441 78½	Total.....	855,091	1,001,228 54	35,069	70,969 59	8,527	91,243 65½	1,746,921

* Including 76,300 returned to writers, and writers not being found, were again sent to the Dead-Letter Office.

A. D. HAZEN,
Third Assistant Postmaster-General.

No. 12.—Statement showing the amount, classification, and disposition of unmailable matter received during the fiscal year ended June 30, 1879.

Received.		How disposed of.	
<i>Letters.</i>		<i>Letters.</i>	
Held for postage:		Held for postage:	
Domestic address.....	284,573	Notice sent to collect postage:	
Foreign address.....	19,771	Domestic address.....	138,480
		Foreign address (A).....	13,060
		Official and Navy forwarded.....	1,749
		Opened (B).....	154,445
			308,344
Misdirected.....	308,344	Misdirected:	
Blank.....	63,073	Returned to foreign countries.....	4,319
Containing unmailable matter.....	7,944	Address corrected and forwarded.....	5,918
Hotel.....	1,221	Opened (B).....	52,836
Fictitious.....	47,166		
	17,544	Blanks: Opened (B).....	
		Containing unmailable matter: Opened (B).....	
		Hotel:	
		Returned to foreign countries.....	1,600
		Opened (B).....	45,566
			47,166
		Fictitious:	
		Returned to foreign countries.....	4,454
		Opened (B).....	13,090
			17,544
		Total.....	443,292
Total number letters received.....	443,292		
		<i>Packages.</i>	
		Examined and turned over to property branch.....	
		18,552	
		Held for postage.....	9,204
		Misdirected.....	1,271
		Blank.....	5,415
		Excess of weight and size.....	1,639
		Containing unmailable matter.....	1,023
		Total number packages received.....	18,552
		Total.....	461,844
		Total.....	461,844

No. 12.—Statement showing the amount, classification, and disposition of unmailable matter, &c.—Continued.

A.—Disposition of letters treated with circulars.		Total.	B.—Contents and disposition of letters opened.		Total.
Awaiting reply to circular at beginning of year.....		10,984	Money.....		4,820
Treated with circular during the year:			Drafts, checks, &c.....		4,237
Unopened.....		138,490	Valuable papers.....		4,019
Resealed.....		30,100	Valuable articles.....		2,146
Foreign address.....		13,660	Photographs.....		8,058
Forwarded upon reply to circular:		191,284	Stamps.....		5,780
Unopened.....		104,341	Nothing of value.....		251,092
Resealed.....		19,651	Total number.....		275,102
Foreign address.....		10,780	Containing inclosures turned over to different branches.....		24,010
Turned over to opening branch:		134,773	Without inclosures—returned to writers.....		113,781
Unopened.....		44,809	Without inclosures—destroyed.....		107,211
Resealed.....		6,538	Without inclosures—rescued and notice of detention sent (A).....		30,100
Awaiting reply to circular at close of the year.....		51,347	Total.....		275,102
		188,119			
		5,115			

Value of stamps received in reply to circulars, \$3,649.02.

A. D. HAZEN,
Third Assistant Postmaster-General.

No. 13.—Statement showing the number of foreign dead letters received and disposed of during the fiscal year ended June 30, 1879.

ORIGINATING IN FOREIGN COUNTRIES.

RECEIVED.		DISPOSITION.			
Class.	Number.	Class.	Returned to country of origin.	Delivered to addressees.	On hand.
Registered letters—		Registered letters.....	3,500	46	123
On hand July 1, 1878.....	76				
Received during the year		Ordinary letters.....	147,686	45	4,831
(including 7 erroneously					
reported last year).....	3,602				
	3,768				
Ordinary letters—		Printed matter, sam-	7,603		
On hand July 1, 1878.....	3,064	ples, &c.....			
Received during year.....	149,688				
	152,762				
Printed matter, samples, &c.....	7,603	Total.....	159,178	91	4,954
	164,223				
Total.....					

ORIGINATING IN THE UNITED STATES AND RETURNED BY FOREIGN COUNTRIES.

RECEIVED.	
Class.	Number.
Registered letters.....	421
Ordinary letters.....	34,669
Printed matter, samples, &c.....	8,623
Total.....	163,119

Statement of undelivered correspondence returned to and received from each of the several foreign countries.

Country.	Returned to—				Received from—			
	Registered.	Ordinary.	Printed.	Total.	Registered.	Ordinary.	Printed.	Total.
Austro-Hungary.....	577	2,903	921	4,401				
Argentine Republic.....	2	98	8	108				
Belgium.....	29	643	283	955				
Bermuda.....	1	123		129		143		143
Brazil.....	7	409	11	427		485		485
British India.....	6	244	4	254				
British Guiana.....		45		45		63	7	70
Canada.....	590	46,090	59	46,739	155	38,790	562	39,497
Cuba.....	11	999	3	1,013				
Denmark.....	16	1,506	26	1,548				
Danish West Indies.....	1	140	3	144		244		244
Egypt.....	1	51	2	54				
Ecuador.....		14		14				
France.....	101	4,729	2,957	7,787				
French West Indies.....		60		60				
Great Britain.....	629	43,186	1,856	45,671	237	29,270	4	29,511
Germany.....	1,080	20,259	213	21,552				
Greece.....	8	85	40	113				
Guatemala.....		47		47				
Hong-Kong.....	2	134		136		121		121
Hawaii.....	1	212		213		296		296
Italy.....	173	7,637	614	8,424				
Jamaica.....	3	164		167	4	384		388
Japan.....	7	292	4	303	3	134		137
Luxemburg.....	7	191	3	201				
Mexico.....		719	3	722				

Statement of undelivered correspondence returned to and received from, &c.—Continued.

Country.	Returned to—				Received from—			
	Registered.	Ordinary.	Printed.	Total.	Registered.	Ordinary.	Printed.	Total.
Norway	39	3,244	31	3,314				
Netherlands	14	828	252	1,094				
Netherland West Indies		18		18				
Newfoundland	5	180		185	1	286		287
New South Wales	10	405		415	14	534		548
New Zealand	3	350	3	356	3	349		352
Peru	1	210		211				
Portugal	7	1,988	13	2,008				
Porto Rico		147		147				
Queensland	5	77		82		181		181
Roumania	10	29	1	40				
Russia	103	1,823	32	1,958				
Servia	2	7	1	10				
Spain	11	409	215	635				
Sweden	57	5,118	114	5,289				
Switzerland	73	1,619	10	1,702				
Salvador		12		12				
Trinidad		83		83				
Turkey	1	44	2	47				
Venezuela		31		31				
Victoria	6	349	9	364	1	252		253
Miscellaneous					2	3,756	1	3,761
Postal Union						19,399	7,452	26,853
Total	3,599	147,886	7,693	159,178	424	94,609	8,026	103,119

Foreign postage reclaimed by the United States, 978 francs 25 centimes; by foreign countries, 214 francs 48 centimes.

A. D. HAZEN,
Third Assistant Postmaster-General.

No. 14.—Statement showing the number, classification, and disposition of dead registered letters during the year ended June 30, 1879.

Number and class of letters received.		Mode of treatment.	
Domestic:		Delivered without being opened:	
Official	5	Returned to foreign countries ..	3,685
Ordinary	2,173	Forwarded to Executive Departments	5
Request	30	Returned to writer as per card and request on envelope	30
Foreign	2,208		3,720
	3,685	Opened	2,173
Total	5,893	Total	5,893

Number and contents of letters opened.		Disposition of opened letters.				
		Delivered.	Filed.		Outstanding.	Total.
			At once.	Returned and filed.		
Drafts, notes, money-orders, &c	214	191	1	16	6	214
Money (including fifteen on hand July 1, 1878)	963	908	2	26	27	963
Photographs, receipts, certificates, &c	177	164		13		177
Property	118	108	6	3	1	118
Nothing of value	701	591	70	40		701
Total	2,173	1,962	79	98	34	2,173

A. D. HAZEN,
Third Assistant Postmaster-General.

No. 15.—*Number of registered letters and parcels transmitted through the mails from each State and Territory in the United States during the fiscal year ended June 30, 1879.*

States.	Quarter ended September 30, 1878.			Quarter ended December 31, 1878.					
	Domestic.	Foreign.	Free.	Domestic third class.		Foreign third class.		Free.	
Alabama.....	12,053	42	1,619	14,741	212	61	-----	1,567	
Arkansas.....	9,248	72	1,599	12,467	175	52	-----	1,649	
California.....	20,654	3,467	1,606	26,240	7,664	4,508	27	1,678	
Colorado.....	10,293	143	572	12,788	1,104	260	4	686	
Connecticut.....	11,956	511	33,763	14,446	795	744	2	33,821	
Delaware.....	1,577	14	92	1,733	36	23	-----	123	
Florida.....	6,362	64	692	7,537	220	64	-----	731	
Georgia.....	14,868	81	1,948	19,554	373	149	-----	2,289	
Illinois.....	57,889	2,089	8,606	70,472	5,089	2,067	223	8,478	
Indiana.....	35,993	237	4,180	42,920	621	199	6	4,390	
Iowa.....	34,079	296	4,000	44,060	922	510	18	5,973	
Kansas.....	24,026	176	8,013	31,136	750	268	2	3,331	
Kentucky.....	15,978	125	1,333	17,470	369	101	-----	1,909	
Louisiana.....	12,844	467	1,049	15,520	463	632	-----	1,290	
Maine.....	17,530	495	1,106	20,893	762	495	-----	972	
Maryland.....	10,914	323	540	11,744	410	473	7	762	
Massachusetts.....	30,473	3,273	15,895	35,652	3,007	4,086	2	16,217	
Michigan.....	33,889	1,890	8,835	40,881	1,187	2,067	-----	3,460	
Minnesota.....	20,916	441	2,133	28,767	496	674	-----	1,577	
Mississippi.....	10,179	28	549	11,478	116	80	4	1,047	
Missouri.....	37,567	486	2,670	45,564	3,479	811	2	2,813	
Nebraska.....	12,615	227	1,103	17,471	253	261	4	1,400	
Nevada.....	5,038	597	351	6,443	479	767	-----	621	
New Hampshire.....	9,082	475	690	10,590	200	646	-----	746	
New Jersey.....	14,774	693	577	14,658	979	1,115	18	775	
New York.....	98,896	13,303	58,411	112,704	21,057	14,679	391	55,396	
North Carolina.....	16,441	43	986	19,273	301	43	-----	1,233	
Ohio.....	50,551	1,063	3,570	62,530	2,612	1,275	5	5,494	
Oregon.....	5,434	65	584	7,220	325	296	-----	759	
Pennsylvania.....	63,758	2,303	3,471	74,548	3,231	2,090	32	4,212	
Rhode Island.....	3,989	418	104	4,004	175	414	1	126	
South Carolina.....	9,855	77	830	13,442	160	118	-----	1,086	
Tennessee.....	14,537	75	1,602	16,620	226	77	1	1,621	
Texas.....	22,788	423	3,738	31,114	1,047	546	3	4,628	
Vermont.....	9,801	453	771	12,394	322	512	-----	644	
Virginia.....	20,317	143	1,715	23,454	669	189	-----	1,854	
West Virginia.....	9,609	50	640	11,271	116	86	-----	239	
Wisconsin.....	32,823	637	3,948	44,003	917	801	23	4,133	
Alaska Territory.....	20	-----	10	-----	-----	-----	-----	-----	
Arizona Territory.....	2,054	9	92	2,478	88	26	-----	128	
Dakota Territory.....	4,958	217	287	7,717	109	238	-----	466	
District of Columbia.....	10,922	502	12,339	10,609	569	466	10	12,445	
Idaho Territory.....	2,906	26	68	4,214	195	50	1	53	
Indian Territory.....	1,526	13	177	1,970	43	9	-----	217	
Montana Territory.....	3,198	17	240	4,856	93	51	-----	64	
New Mexico Territory.....	1,975	12	64	2,470	161	83	-----	67	
Utah Territory.....	4,801	118	227	6,208	207	116	1	267	
Washington Territory.....	2,601	70	829	3,868	201	64	-----	221	
Wyoming Territory.....	2,381	31	421	3,009	292	41	-----	223	
Total.....	866,612	36,765	188,185	1,055,429	63,285	44,485	796	195,723	

No. 15.—Number of registered letters, &c., transmitted through the mails, &c.—Continued.

States.	Quarter ended March 31, 1879.					Quarter ended June 30, 1879.				
	Domestic third class.		Foreign third class.		Free.	Domestic third class.		Foreign third class.		Free.
Alabama.....	19,949	279	107	2	1,829	18,030	198	83	4	1,935
Arkansas.....	16,183	215	54	4	1,792	15,783	262	68	.....	1,797
California.....	25,595	5,121	3,750	108	1,664	24,237	5,316	3,455	112	1,686
Colorado.....	12,709	777	267	11	726	10,130	826	288	10	796
Connecticut.....	15,825	569	680	5	33,923	14,954	642	602	14	33,978
Delaware.....	1,743	21	12	3	151	1,868	35	9	.....	145
Florida.....	9,295	268	91	9	868	8,604	310	145	.....	774
Georgia.....	21,938	341	169	.....	2,361	20,050	430	107	3	2,260
Illinois.....	78,268	5,139	2,789	83	9,453	69,352	5,721	2,735	87	8,835
Indiana.....	49,731	367	354	11	4,733	44,725	538	260	7	4,851
Iowa.....	51,431	650	589	11	5,931	46,944	560	494	9	5,912
Kansas.....	36,316	549	308	2	3,214	35,613	712	286	.....	3,292
Kentucky.....	21,056	509	179	.....	1,311	21,771	1,205	107	2	1,739
Louisiana.....	19,802	566	780	1	1,390	21,081	802	701	15	8,117
Maine.....	22,149	821	323	2	960	22,566	940	535	.....	1,163
Maryland.....	12,979	489	878	17	528	12,052	784	398	17	870
Massachusetts.....	86,815	2,736	1,133	2	18,146	36,534	3,625	3,496	2	17,548
Michigan.....	43,895	728	1,583	25	3,367	40,609	819	2,169	6	8,889
Minnesota.....	29,721	374	682	.....	1,834	30,111	468	646	.....	1,899
Mississippi.....	17,960	147	65	.....	1,152	17,164	361	49	4	1,788
Missouri.....	54,708	3,482	709	11	2,442	49,968	5,466	745	6	3,864
Nebraska.....	18,846	182	310	2	1,209	18,366	279	326	5	1,502
Nevada.....	5,730	306	576	6	491	5,563	606	510	8	540
New Hampshire.....	11,725	103	510	.....	745	11,342	138	338	.....	971
New Jersey.....	15,228	623	460	73	712	16,016	717	947	21	982
New York.....	115,440	21,955	15,204	506	64,905	115,440	34,692	14,550	551	89,715
North Carolina.....	22,412	172	61	.....	1,574	21,259	258	50	2	1,875
Ohio.....	71,698	2,203	1,865	18	6,848	68,163	2,387	1,173	35	7,069
Oregon.....	8,621	248	260	.....	734	6,957	310	257	.....	859
Pennsylvania.....	82,021	3,625	2,642	109	4,230	83,991	4,650	2,518	142	2,674
Rhode Island.....	4,123	216	469	6	145	3,904	240	428	14	136
South Carolina.....	13,945	186	96	.....	1,151	13,850	139	80	7	1,119
Tennessee.....	20,925	300	118	2	1,895	19,839	469	108	2	2,006
Texas.....	89,786	1,375	691	11	4,219	34,410	1,682	622	19	4,457
Vermont.....	12,432	222	528	13	941	12,015	201	644	13	940
Virginia.....	24,725	554	229	13	1,832	24,091	661	139	14	1,932
West Virginia.....	12,156	119	81	.....	715	12,329	126	30	.....	798
Wisconsin.....	45,258	630	862	11	4,248	41,972	747	851	14	4,263
Alaska Territory.....	9	.....	1	.....	5	.....	.....	.....	.....	.....
Arizona Territory.....	2,713	140	25	2	183	3,927	148	30	.....	150
Dakota Territory.....	7,249	164	271	1	459	8,825	248	264	1	554
District of Columbia.....	11,077	478	301	15	14,824	14,580	630	845	34	10,106
Idaho Territory.....	4,291	182	56	2	71	4,329	168	44	1	71
Indian Territory.....	2,494	44	9	.....	213	2,270	54	11	1	211
Montana Territory.....	5,056	157	73	1	164	4,908	222	108	8	138
New Mexico Territory.....	2,777	201	30	.....	79	3,346	236	23	.....	85
Utah Territory.....	6,428	354	134	10	220	6,228	310	119	12	222
Washington Territory.....	4,326	208	73	.....	280	3,613	205	61	.....	392
Wyoming Territory.....	2,831	258	46	1	371	2,809	278	47	1	413
Total.....	1,172,385	59,351	40,433	1,109	211,053	1,132,653	80,861	42,001	1,202	236,676

No. 15.—Number of registered letters, &c., transmitted through the mails, &c.—Continued.

States.	Total.			Grand total of letters registered for year ending June 30, 1879.	Fees received.	Increase of letters and parcels over the year 1878.	Increase of fees over 1878.
	Domestic third class.	Foreign third class.	Free.				
Alabama	64,772	689	293	6,950	72,710	\$6,576 00	9,919
Arkansas	53,681	652	246	6,837	61,420	5,458 30	3,172
California	96,726	18,101	15,180	6,834	137,068	13,025 40	28,898
Colorado	51,920	2,707	958	2,780	58,390	5,561 00	17,298
Connecticut	57,181	2,006	2,537	125,545	197,290	6,174 50	3,633
Delaware	6,921	92	58	3	7,584	707 40	—6
Florida	31,888	798	364	9	35,924	3,305 90	3,163
Georgia	76,410	1,144	506	3	86,912	7,896 80	10,178
Illinois	275,481	15,949	10,280	392	308,472	30,210 20	28,225
Indiana	173,369	1,526	1,050	24	184,354	194,323	14,378
Iowa	176,514	2,132	1,888	38	212,718	18,057 30	10,218
Kansas	127,091	2,011	1,038	4	128,850	13,014 40	34,440
Kentucky	76,275	2,083	522	2	84,265	7,888 20	9,645
Louisiana	69,047	1,631	2,580	16	80,239	7,347 40	—187
Maine	83,138	2,523	1,848	2	91,792	8,751 10	4,363
Maryland	47,689	1,683	1,572	41	53,925	5,098 50	—19
Massachusetts	139,474	9,308	11,988	6	228,642	16,083 00	23,190
Michigan	159,364	2,734	7,709	30	184,807	16,983 70	13,680
Minnesota	109,515	1,335	2,443	7	121,036	11,329 30	5,579
Mississippi	56,781	624	222	8	62,171	5,763 50	—2,964
Missouri	187,807	12,427	2,731	19	214,873	20,298 40	15,556
Nebraska	67,198	714	1,124	11	74,261	6,904 70	12,783
Nevada	22,804	1,391	2,450	14	28,463	2,665 90	2,965
New Hampshire	42,739	441	1,998	8	48,303	4,514 90	4,403
New Jersey	60,671	2,519	3,215	112	69,383	6,631 70	4,903
New York	442,480	77,704	57,736	1,448	847,795	57,936 90	125,429
North Carolina	79,385	731	196	2	86,002	8,031 40	4,794
Ohio	253,287	7,203	4,876	58	288,285	26,537 40	31,582
Oregon	28,232	881	890	2	32,929	2,999 30	6,056
Pennsylvania	304,818	11,509	10,153	263	340,847	32,636 00	24,037
Rhode Island	16,000	631	1,724	21	18,887	1,537 00	1,274
South Carolina	51,092	485	871	7	56,993	5,195 50	8,615
Tennessee	71,921	1,005	878	5	80,503	7,330 90	1,806
Texas	128,698	4,104	2,262	33	150,967	13,451 70	10,946
Vermont	46,642	745	2,138	26	53,047	4,955 10	—562
Virginia	92,587	1,844	700	27	102,527	9,519 90	12,218
West Virginia	45,365	861	147	2	48,744	4,587 30	2,996
Wisconsin	164,056	2,294	3,151	48	180,141	16,954 90	5,551
Alaska Territory	44	1	1	1	45	4 50	6
Arizona Territory	11,172	416	90	2	12,233	1,168 00	2,444
Dakota Territory	28,749	521	990	2	31,962	3,026 20	9,595
District of Columbia	47,138	1,677	1,614	59	101,202	5,048 80	11,880
Idaho Territory	15,740	545	176	4	16,728	1,646 50	4,736
Indian Territory	8,500	141	42	1	9,555	874 40	903
Montana Territory	18,016	472	249	9	19,772	1,874 40	4,498
New Mexico Territory	10,568	598	98	1	11,569	1,126 40	2,706
Utah Territory	23,665	871	487	23	25,962	2,504 00	3,184
Washington Territory	14,528	614	268	1	16,742	1,541 00	4,142
Wyoming Territory	11,030	828	165	2	13,566	1,202 50	436
Decrease							537,589
Increase							7,371
Total	4,227,079	203,497	163,684	3,097	5,429,022	450,735 70	530,218

RECAPITULATION.

Total domestic letters	4,227,079	4,430,576	434,575
Total domestic third class	203,497		
Total foreign letters	163,684	166,781	12,788
Total foreign third class	3,097		
Total free	831,665	82,855	
Grand total	5,429,022	530,218	
Total fees received		\$450,735 70	44,736 30

A. D. HAZEN,
Third Assistant Postmaster-General.

No. 10.—Table showing number of packages dispatched in registered through pouches from the post-office at New York to other through-pouch offices, by months, during fiscal year ending June 30, 1879.

Cities.	1878.						1879.					
	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.
Philadelphia.....	1,107	927	797	1,103	1,048	1,012	1,730	1,324	2,108	2,375	2,178	2,085
Saint Louis.....	2,369	1,643	1,131	2,241	1,468	1,712	2,044	1,104	4,300	3,897	3,645	3,630
Indianapolis.....	2,207	1,185	1,159	2,264	1,205	1,322	3,332	2,271	3,248	3,896	3,715	3,694
Cincinnati.....	2,546	1,206	1,392	2,163	1,909	2,266	3,005	2,217	2,837	3,953	3,403	3,588
Pittsburgh.....	1,300	1,206	1,195	1,416	1,240	1,230	4,779	2,281	3,869	4,636	4,191	4,588
Boston.....	1,893	1,521	1,241	1,835	1,717	1,404	2,011	2,491	4,312	4,278	3,282	3,453
Portland.....	1,983	859	852	1,263	1,231	1,250	2,282	1,700	1,563	2,786	1,856	1,819
Washington.....	730	674	690	763	773	753	942	823	1,042	2,094	2,494	2,509
Richmond.....	88	76	70	84	100	122	317	107	541	2,336	2,154	2,062
Chicago.....	4,693	3,010	2,042	4,454	2,895	3,472	5,312	3,023	5,523	9,334	9,416	9,069
Cleveland.....	725	382	338	763	512	479	809	430	813	867	761	862
Detroit.....	966	564	375	868	512	479	809	430	813	867	761	862
Albany.....	1,239	1,137	832	1,143	1,003	1,323	1,396	1,016	1,024	1,308	1,290	1,463
Buffalo.....	364	358	301	365	324	339	455	364	453	694	848	893
San Francisco.....	357	370	306	423	396	439	488	461	1,062	1,438	1,511	1,856
Augusta.....	306	220	160	368	215	264	321	173	1,062	218	254	341
Savannah.....	317	294	200	336	300	368	446	400	682	766	827	1,013
Atlanta.....	.....	.....	.....	.....	.....	.....	893	432	663	633	1,239	1,408
Sacramento.....	.....	.....	.....	.....	.....	.....	827	421	400	682	878	1,013
Ogden.....	.....	.....	.....	.....	.....	.....	914	421	759	774	736	815
New Orleans.....	.....	.....	.....	.....	.....	.....	914	421	759	774	736	815
Toledo.....	.....	.....	.....	.....	.....	.....	875	375	628	547	2,089	2,516
Chattanooga.....	.....	.....	.....	.....	.....	.....	790	750	750	799	873	970
Lynchburg.....	.....	.....	.....	.....	.....	.....	819	819	819	819	819	819
Wilmington.....	.....	.....	.....	.....	.....	.....	842	842	842	842	842	842
Baltimore.....	.....	.....	.....	.....	.....	.....	851	851	851	851	851	851
Jersey City.....	.....	.....	.....	.....	.....	.....	114	114	114	114	114	114
Brooklyn.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total.....	327,909	14,809	1,169	1,169	1,169	1,169	1,169	1,169	1,169	1,169	1,169	1,169

A. D. HAZEN,
Third Assistant Postmaster-General.

No. 17.—Statement showing the number and value of registered packages forwarded during the fiscal year ended June 30, 1879, for the Post-Office and Treasury Departments.

Description.	Number of packages.	Value.
Postage-stamps from New York agency.....	188,215	\$22,196,628 11
Stamped envelopes and newspaper-wrappers from Hartford agency.....	131,571	5,124,352 82
Postal cards from New York and Holyoke agencies.....	61,803	2,218,070 00
Superintendent money-order system, drafts.....		807,871 00
Money-order branch Washington city post-office.....	241	916,546 00
Total for the Post-Office Department.....	381,830	31,263,467 93
Increase over previous year.....	8,817	2,606,280 17
Secretary of the Treasury received and sent.....	12,681	271,005,215 60
Register of the Treasury received and sent.....	12,580	219,051,850 00
United States Treasurer received—		
Bonds and coupons.....	342	4,456,069 00
Silver certificates.....	5	3,400,000 00
Currency, including legal-tenders, national-bank notes, and fractional currency.....	3,140	170,928 22
Coins.....	66	1,270 12
United States Treasurer sent.....	3,006	2,445,054 45
United States bonds, incomplete currency, and national-bank notes sent from Treasury Department (Comptroller of Currency).....	1,850	371,248,500 00
Internal-revenue stamps.....	17,430	128,140,794 42
Documentary and proprietary stamps from New York agency.....	637	324,275 12
Total for the Treasury Department.....	51,237	1,000,253,977 17
Aggregate.....	433,067	1,081,517,445 10

A. D. HAZEN,
Third Assistant Postmaster-General.

No. 18.—Statement showing the operations of the registered-letter system at the cities of New York, N. Y., Chicago, Ill., and Washington, D. C., during the fiscal year ended June 30, 1879.

Description.	New York.	Chicago.	Washington.	Total.
Number of letters registered.....	453,332	48,542	99,294	601,168
Number of registered letters received for delivery.....	540,500	277,223	95,239	912,962
Number of registered letters received for distribution.....	265,887	260,763	12,000	538,650
Number of parcels of third and fourth class registered.....	69,644	12,730	1,736	84,110
Number of registered parcels of third and fourth class received for delivery.....	28,975	3,049	1,512	33,536
Number of registered parcels of third and fourth class received for distribution.....	5,000	21,257	21	26,278
Number of registered packages received.....	363,096	585,379	78,042	926,517
Number of registered packages in transit.....	195,600	325,098	27,500	548,198
Number of registered packages made up and mailed.....	292,949	157,592	38,661	489,202
Number of through registered pouches received.....	9,811	8,580	3,515	21,906
Number of through registered pouches in transit.....	4,291	509	1,000	5,800
Number of through registered pouches made up and dispatched.....	14,309	7,756	3,297	25,362
Total number of registered letters, parcels, packages, and pouches handled.....	2,243,403	1,489,077	359,917	4,092,397
Value of gold coin received in registered mail.....	\$11,754,000			
Value of bullion received in registered mail.....	821,800			

A. D. HAZEN,
Third Assistant Postmaster-General.

INCREASE OF REGISTRY FEES.

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No. 19.—Statement showing the increase in the amount of fees collected on registered matter at twenty-five leading offices of the country during the fiscal year ended June 30, 1879, over the amount for preceding year.

Name of office.	State.	Amount collected in 1878.	Amount collected in 1879.	Increase.	
				Amount.	Per cent.
New York	New York	\$18,947 70	\$27,737 50	\$8,789 80	46.04
Philadelphia	Pennsylvania	4,348 00	5,706 60	1,358 60	31.24
Brooklyn	New York	1,716 60	2,175 00	458 40	26.7
Saint Louis	Missouri	2,255 20	3,410 50	1,155 30	50.1
Chicago	Illinois	3,850 30	5,654 50	1,804 20	46.85
Baltimore	Maryland	1,602 80	1,862 40	259 60	16.12
Boston	Massachusetts	4,295 30	5,895 00	1,599 70	37.24
Cincinnati	Ohio	1,602 50	1,742 60	140 10	8.74
New Orleans	Louisiana	3,120 90	2,668 50	*451 40	*14.46
San Francisco	California	3,886 50	5,330 40	1,443 90	37.15
Buffalo	New York	753 20	836 90	83 70	11.11
Washington	Dist. of Columbia	3,243 20	5,031 60	1,788 40	55.14
Newark	New Jersey	739 60	903 60	164 00	22.17
Louisville	Kentucky	957 90	1,250 20	292 30	30.52
Cleveland	Ohio	998 40	1,230 60	231 80	23.20
Pittsburgh	Pennsylvania	895 60	1,270 50	374 90	41.86
Jersey City	New Jersey	296 50	355 00	58 50	19.73
Detroit	Michigan	613 20	773 50	160 30	25.98
Milwaukee	Wisconsin	679 70	833 90	154 20	22.68
Albany	New York	640 60	696 30	55 70	8.69
Providence	Rhode Island	631 10	644 40	13 30	2.10
Rochester	New York	549 40	804 20	254 80	46.37
Allegheny	Pennsylvania	237 60	310 60	73 00	30.72
Richmond	Virginia	546 30	712 90	166 60	30.5
New Haven	Connecticut	512 80	629 70	116 90	22.79
Total		57,921 30	78,467 90	20,998 00	36.25

* Decrease

A. D. HAZEN,
Third Assistant Postmaster-General.

OCEAN MAILS.

OCEAN MAILS.

Statement showing the amounts recognized in payment of ocean-mail transportation performed during the fiscal year ended June 30, 1879.

TRANSATLANTIC MAILS.

By Cunard Line, 52 trips from New York.....	\$34,648 16	
By Cunard Line, 33 trips from Boston	1,194 42	
		\$35,842 58
By Hamburg Line, 52 trips from New York.....		21,968 49
By Liverpool and Great Western Line, 37 trips from New York.....		23,620 09
By North German Lloyd Line, 52 trips from New York.....	21,226 07	
By North German Lloyd Line, 24 trips from Baltimore	13 68	
		21,239 75
By White Star Line, 51 trips from New York		22,120 68
By Inman Line, 52 trips from New New York.....		21,434 97
By Anchor Line, 47 trips from New York.....		2,227 86
By Canadian Line, 51 trips from New York.....		803 50
By American Line, 44 trips to Philadelphia.....		1,531 09
By General Transatlantic French line.....		2,983 63
		\$153,749 64

TRANSPACIFIC MAILS.

To Japan and Hong-Kong, China:		
By Pacific Mail Line	\$809 18	
By Occidental and Oriental Line.....	1,156 73	
		1,965 91
To Shanghai, China:		
By Pacific Mail Line	308 20	
By Occidental and Oriental Line.....	272 80	
		581 00
To New South Wales, other Australian colonies, New Zealand, Fiji Islands, and the Sandwich Islands:		
By Pacific Mail Line.....	8,457 48	
		11,004 39

MISCELLANEOUS.

To and from the Isthmus of Panama, Central America, and South Pacific:		
Outward mails	\$8,644 44	
Inward mails	7,181 85	
		15,826 29
To Mexico		4,931 34
To Cuba		5,366 22
To and from other West India Islands:		
Outward mails	3,131 15	
Inward mails	710 76	
		3,841 91
To Brazil		3,061 64
From Uruguay		44 90
To Venezuela		744 09
To Canada.....		337 64
		34,154 03
Total		198,908 06

REPORT
UPON THE
POSTAL SERVICE OF ENGLAND AND FRANCE.

BY
W. A. KNAPP,
CHIEF CLERK OF THE POST-OFFICE DEPARTMENT.

20 P M G

REPORT
UPON THE
POSTAL SERVICE OF ENGLAND AND FRANCE,
BY
W. A. KNAPP, CHIEF CLERK POST-OFFICE DEPARTMENT.

POST-OFFICE DEPARTMENT,
Washington, D. C., August 20, 1879.

SIR: In compliance with the instructions contained in your letter of April 18, 1879, I left New York on the following day per steamship *City of Berlin*, arriving at Liverpool on the 28th April and in London on the 29th.

THE BRITISH POSTAL SERVICE.

As soon as practicable I called upon our minister, Mr. Welsh, and, upon making known to him the object of my visit, was furnished with a letter of introduction to Lord John Manners, Postmaster-General, which secured for me a very cordial reception from the British postal authorities, and the assurance on their part that all possible facilities should be afforded me in the prosecution of my investigations—an assurance which was carried out with a heartiness and good will which left no doubt as to its genuineness.

Every inquiry was promptly answered, and I have been furnished with many reports, documents, blank forms, &c., relating to the different branches of the service, and in several instances officers of the department gave themselves the trouble to write out at length details of special subjects inquired into.

To Mr. Lewin Hill, of the Secretary's office, and Mr. Grey, of the Registration Branch, I am specially indebted for favors of this kind.

It required but a day or two to convince me that with the limited time at my disposal it would be impossible to familiarize myself with *all* the details of the postal service, and I therefore endeavored only to gain as full a knowledge as possible, first, of the general plan of organization, and second, of such salient points as correspond with similar features in our own service.

DEPARTMENTAL ORGANIZATION.

In studying departmental and bureau organization I was met at the outset by the apparent absence of any dividing line between the Department proper, as we understand it, and the local organization.

The London post-office is the great center of postal business, and its operations, as well as those of other local offices, are controlled directly by the officers of the Department proper, who also supervise many details that in our service are left to local officers. In fact, the "Department" seems to be entirely merged in the London office, but, of course,

with full control over all other offices and over all branches of the service.

As a matter of convenience, therefore, I shall hereafter designate as the "Central Office" that part of the Postmaster-General's staff which has the supervision of the general service.

The Postmaster-General is *ex-officio* a member of the Cabinet, and is consequently liable to removal with every change of the Cabinet.

The permanent head of the Department is, therefore, the Secretary, who, like all other officers and employes, is appointed for life or during good behavior. There is also a Financial Secretary, who has charge of all financial operations and accounts of the Department, and three Assistant Secretaries, one in charge of home mails, whose duties are similar to those of the Second Assistant Postmaster-General in the United States; one in charge of foreign and colonial mails, with duties corresponding to those of the Superintendent of Foreign Mails in our service, and one in charge of the telegraph system.

Under the direct supervision of the Secretary are the following branches or divisions, viz: Appointment, which makes up all cases for appointments and promotions; Discipline, which takes cognizance of all delinquencies on the part of officers and employes; Provincial Post-Offices and Buildings, which fixes allowances of postmasters, provides proper office-room, and has charge of street letter-boxes; General Correspondence, the duties of which are sufficiently indicated by the name; Registry, which receives and registers correspondence, and has charge of files and records; also the Money Order and Savings Bank Branches.

Attached to the Financial Secretary's office is the office of the Accountant-General, to whom all accounts are sent for audit, and by whom they are submitted to the Auditor-General for revision. Neither of these two auditing officers is connected with the Treasury Department, the latter making his report directly to Parliament.

The dispatch, distribution, and delivery of mails throughout the kingdom are in charge of an officer whose functions would seem to be a combination of duties which in the United States are distributed among the Second Assistant Postmaster-General, the Superintendent of Railway Mail Service, and the Superintendent of Free Delivery.

It seems to me worth considering whether the creation of such an office in our own service, having a general supervision of carrier and "Star," as well as railway and steamboat routes, would not be beneficial. Such an arrangement would have the effect of consolidating under one head many details which now require the co-operation of at least three separate branches of the service.

LOCAL ORGANIZATION.

The United Kingdom is divided into fifteen districts, each in charge of a Surveyor, who is the representative of the Central Office, and who is the superior of all the postmasters in his district. In Liverpool, Manchester, and Glasgow the postmasters are *ex-officio* surveyors of their respective districts. Each Surveyor is required to personally inspect and report upon every office in his district at intervals of not less than three years, and as much oftener as circumstances may require. He is responsible for the proper management of the offices within his district, and through him all business between the postmasters and the Central Office is conducted.

To the Surveyor are addressed all the applications for promotion, al,

requests by postmasters for increased allowances, and in fact all matters pertaining to the management of post-offices. He decides nearly all questions involving the construction of rules and the details of the service within his district, thus relieving the Central Office from the consideration of many trivial matters.

To fill such a position requires a full and accurate knowledge of postal laws and regulations united to great executive ability, and consequently the Surveyors are selected from among the ablest and most experienced officers of the Department.

APPOINTMENTS.

Where the annual income of a postmaster amounts to £120 in England, or £100 in Scotland or Ireland, the appointment (in case of a vacancy) is made by the Postmaster-General from persons in the postal service. In such cases an advertisement is published announcing the vacancy, and inviting applications from subordinate officers and clerks, which must be sent through their superior officers, who indorse upon the application their opinion as to the qualifications of the applicant. The record of each applicant is carefully examined, and the appointment is given to the one who seems to be best fitted for the place to be filled. The effect of this system is that an assistant postmaster or clerk in one office may be appointed postmaster at another office, or the vacancy may be filled by an officer or clerk in the general service. The object is to find the man best qualified for the place, and the *residence* of the applicant is not considered.

To illustrate: If the postmastership at Manchester should become vacant, an officer or clerk in the general service, or in the post-office at London, York, Liverpool, or Birmingham would be quite as eligible as any person in the Manchester office. Of this class of officers there are about four hundred.

In case of a vacancy in any office of which the salary is less than £100 or £120 the appointment is made by the Treasury upon the recommendation of the member of Parliament representing the borough or district in which the vacancy exists.

In the general service, in which term I include all officers, clerks, and employes of all grades, except postmasters, original appointments with a few special exceptions are made upon the recommendation of the Civil Service Commission of the Treasury, and only to the lower grades. For such appointments competitive examinations are required, but for promotions no examination is necessary, except in the grade of "sorting clerks," it being understood that more reliance is to be placed upon the record of an applicant for promotion as reported by his immediate superiors, than upon the results of a general examination.

In regard to the "sorting clerks" the examination is confined to the practical details of the work required of them, such as the dispatch and distribution of mails, &c.

In case of disability resulting from old age or injuries received in the service, employes are retired upon a pension, the amount of which is determined according to salary and the length and value of service rendered. In other words, the civil service is organized upon the same plan as the military and naval services; all civil servants are certain that so long as they perform their duties faithfully they are secure in their positions, and that when incapacitated, from old age or other causes incident to the service, they will be provided for.

SALARIES OF OFFICERS.

There is no law fixing salaries. They are adjusted by the Treasury, and the only legal restriction upon the amounts paid is that the expenditures in any one year cannot exceed the gross amount appropriated by Parliament for the service of the post-office. This rule holds good in regard to all other expenditures of the post-office. The salaries of the officers and higher grades of clerks are much higher than in our service. Thus, in the General Post-Office at London, which is substantially the same as the Post-Office Department of the United States, there is a Secretary with a maximum salary of £2,000; one Financial Secretary, maximum salary, £1,500; three Assistant Secretaries, with a maximum salary of £1,200; one Chief Clerk, salary £900; five principal clerks, salary £800; four principal clerks, salary £600; a Solicitor, at £2,000; Receiver and Accountant-General, at £1,000; Controller of Money-Order Business at £900; Controller of Circulation, at £1,000; Surveyor of Traveling Post-Offices, at £700.

In addition to the ordinary salaries, several officers and clerks of the Central Office, as well as of some other large post-offices, receive extra allowances for special services, ranging from two shillings per week to £100 per annum. As an illustration, the Chief Clerk of the Secretary's office in London, in addition to his salary of £900 per annum, receives an allowance of £80 per annum as a "clerk in waiting," and a per diem of ten shillings for "table money" while on duty out of office hours. In the London office there are six "clerks in waiting" whose extra duty consists in remaining at the office during the nights to attend to urgent matters which are presented at other times than during the regular office hours. The salaries of subordinate clerks and employés are much lower than in the United States, ranging from seven shillings a week for boy messengers up to £200 per annum for third-class clerks (the lowest grade).

The total number of officers and employés of all grades in the British service, exclusive of such as are employed in the colonial post-office establishments, was, for the year ended December 31, 1878, 45,506, of which number 11,473 were engaged in the postal telegraph service, leaving 34,033 in the postal service proper. Of the total number there are 13,763 postmasters, 10,000 clerks, and 21,000 letter-carriers, sorters, and messengers. The number employed in London alone is 10,665, of which 5,800 are attached to the Central Office, and the rest to the various district offices.

SALARIES OF POSTMASTERS.

For head postmasters there is no fixed scale of remuneration, but the following scale is used as a rough means of testing the reasonableness of the postmasters' claims, and of comparing the proposed expense of a given office with others of similar magnitude:

	Per annum.		
	£	s.	d.
Letters, &c., for delivery, for each 100 per week		22	0
Forwarded letters, &c., for each 100 per week		10	0
Money-order transactions, for each 1,000 per annum	4	0	0
Savings-bank transactions, for each 1,000 per annum	5	0	0
Mail-bags (received and dispatched), one a day (counting as one a bag in each direction)	1	0	0
Night duty, for single hour daily	9	2	6
Private boxes and bags, each		5	0

Head postmasters are required to devote their entire time to the service. With one or two exceptions, which will be rectified upon the

retirement of the present incumbents, the highest salary of any postmaster is that paid at Liverpool and Glasgow, viz, one thousand pounds. At the smaller offices, to which appointments are made by the Treasury, the postmaster is generally engaged in some private business, and is not expected to give his whole time to the service. He is paid partly by salary, partly by percentage on stamps sold, and partly by fees on private boxes and bags. He receives such allowance for assistance as is thought necessary, but has no separate allowance for office-rent or expenses.

The following comparative statement shows the net income of postmasters of various grades :

Name of office.	Net income.	Average number of letters delivered weekly.	Average number of forwarded letters weekly.	Number of money-order and savings-bank transactions yearly.	Number of single hours of duty between 10 p.m. and 5 a. m.	Mean number of sealed bags received and dispatched.	Number of telegrams yearly.
Broadway	£50	4,400	.....	1,900	.....	9	1,200
Shepton Mallet	75	6,900	.....	10,500	1	7	6,800
Tadcaster	100	10,200	.....	8,800	2½	15	7,000
Maldon	125	11,600	.....	15,000	1	15	14,500
St. Albans	150	15,900	.....	19,700	.....	18	18,000
Newcastle Staff	175	19,500	.....	23,200	6	22	23,000
Haverfordwest	200	23,500	.....	20,500	.....	39	32,000
Stamford	225	22,900	.....	28,500	1	41	87,200
Cardarthen	250	45,000	4,200	25,800	.....	70	44,300
Boston	275	31,100	8,900	39,000	10	52	62,000
Rochdale	300	55,800	.....	42,900	.....	41	69,500
Yarmouth	350	54,500	2,000	61,200	10	77	84,600
Croydon	400	63,000	.....	67,800	9	59	53,000
Bolton	450	79,700	.....	69,600	16	94	102,400
Wolverhampton	500	108,200	2,000	100,000	40	118	170,400
Plymouth	550	94,300	48,300	121,600	63	119	376,100
Nottingham	600	178,700	41,700	139,600	55½	179	280,100
Sheffield	650	215,600	54,700	149,500	79	225	441,700
Newcastle-on-Tyne	700	247,000	82,800	204,000	92½	243	1,255,700
Liverpool	1,000	747,700	244,000	563,700	257	864	8,193,000
Glasgow	1,000	696,150	152,000	454,800	242	649	2,279,800

UNIFORMS.

The uniforms of carriers and such other employés as are required to wear uniforms are paid for by the government. The amount expended for this purpose last year was £54,900, or about \$265,360.

DISCIPLINE BRANCH

This branch of the Central Office takes cognizance of all derelictions of duty on the part of employés in the entire service. A record is kept of all infractions of regulations, so that when an officer or employé applies for promotion, his standing is fully known.

At the Central Office, as well as in the larger post-offices, an "attendance book" is kept, in which all officers and employés are required to register the time of their arrival at the office. Loss of time is punished by extra duty, and repeated tardiness subjects the offender to a loss of eligibility to promotion, or, when chronic, to discharge from the service.

On Christmas it is customary for carriers to receive presents from persons supplied by them, and this custom has the full sanction of the department. In case a carrier is frequently reported for carelessness, insubordination, or other dereliction, he is punished by being transferred a few days before Christmas to a new route, where, as a matter of course, he will receive but few or no gratuities.

LEAVES OF ABSENCE.

In the Central Office each officer and employé is granted leave of absence during the year amounting to twenty-eight working days. In the other offices the period of leave varies from fourteen to twenty-eight days', except in Ireland the rural letter-carriers have no leave. Any other absence is punished either by extra duty or forfeiture of pay. In case of absence caused by sickness, from one-third to one-half of the pay is deducted.

TRANSPORTATION OF MAILS.

An act of Parliament requires all railway and packet companies to carry the mails upon any train or boat which may be designated by the Postmaster-General, who has the right to prescribe schedules.

There is no fixed basis of compensation to railway companies, nor is there any legal restriction upon the amount to be paid. It is entirely a matter of agreement and contract between the Postmaster-General and the railway companies, the law simply providing that in case of disagreement the rate shall be fixed by arbitration.

In the adjustment of railway pay the chief elements which enter into the calculation are the space furnished, the speed of the trains, the hours of departure and arrival, and the number of stops made. Weight is of course considered, but is not so important as space, speed, &c. With a view of arriving at the cost of transportation as compared with the same item in our own service, I endeavored to ascertain the weight of the mails carried, and the mileage of the mail trains, but was informed that no such data could be furnished. I am unable, therefore, to compare the cost per pound per mile as I had hoped to do; but taking as a basis the total cost of conveyance, viz, £703,043, or nearly \$3,500,000, as given in the report for the year 1878-'9, and considering the comparatively small mileage, I am convinced that the proportionate cost of transportation is considerably greater than in the United States.

STAR SERVICE.

Service other than by railway and packets is also a matter of agreement and contract, but the contracts instead of being made for a definite period are terminable whenever in the opinion of the Postmaster-General the interests of the service will be advanced thereby. As a matter of justice to contractors, three months' notice is generally given in case of annulment. When from any cause it is desired to make a new contract, an advertisement is published inviting proposals, and from those received the one is selected which from all points of view seems the most advantageous to the government. There is no obligation to award a contract to the lowest bidder, and if the Postmaster-General is satisfied that a bidder is not thoroughly able and willing to faithfully execute his contract his proposal is simply ignored. Bonds are required and penalties are strictly enforced when occasion arises, but I was informed that "failures" of contractors were extremely rare.

Except on a few coach routes, and those on which foot messengers are employed, the mails are always carried in covered carts or wagons of a uniform design prescribed by the department.

TRAVELING POST-OFFICES.

The system of distributing mails on the trains is substantially the same as in the United States; but owing to the shorter distances run

and the greater speed of the trains, viz, from forty-five to sixty miles an hour, it cannot be carried to the same extent as in railway post-offices. For most of the larger cities and towns "direct bags" are used, and most of the mails for offices not on the railway lines are sent to head offices for distribution.

There is very little distribution of registered matter on the trains, as the "direct pouch" system is used to a much greater extent than in our service.

REGISTRATION.

My attention was at the outset attracted to the almost absolute safety of registered matter, the loss since the adoption of the present system being only one in four million, while in our service the loss during the last year was one in a little less than ten thousand. I have therefore devoted more time and study to the registration system than to any other branch of the service.

I cannot do better than to submit as part of this report a memorandum furnished me by Mr. Grey, of the British office, and which is accompanied by all the forms in use. I copy from his notes.

The accompanying patterns of the books used in the process of registration (1, 2, and 3) will best explain the process by which a record of each registered letter is obtained, either in duplicate, triplicate, or quadruplicate, as may be required.

Between each of the sheets is placed one of carbonic paper, and by copying the address of the letter on the top sheet with a hard black-lead pencil an exact *fac-simile* of the entry is transferred by means of the carbonic paper to each of the under sheets, and thus at one operation either two, three, or four copies of the address are produced.

To insure clear impressions in quadruplicate, a metallic plate is placed underneath the last sheet, in order to afford an increased resistance to the point of the pencil. Each of the entries is numbered consecutively in the space provided for the purpose, and the corresponding number is marked on the letter with a red-chalk pencil.

An impression of the dated stamp of the office at which the book is used is then affixed to the letters, and to each of the entries on each of the sheets, as well as on each of the right-hand portion of the last sheet. It is found necessary to stamp each sheet separately with stamping ink, as, the type of the stamp not being so sharp as the point of the pencil, a clear impression cannot be obtained from the carbonic paper.

The mode of dealing with each different class of registered letters and the use made of the three different kinds of manifold books are as follows:

When a letter is presented for registration at a receiving house, either in London or the Provinces, the receiver copies the address into a book of which pattern 4 is a specimen, and gives the form printed in black to the sender as a receipt for the letter and retains the red sheet in the book. He then crosses the letter with a blue pencil and copies the address on the letter bill (No. 6) which accompanies his next dispatch of letters to his head office, the registered letter being folded in the bill and then tied up with the ordinary correspondence, after having been checked by and signed for by the collecting letter-carriers.

At the window, however, of the head office in London, at the Lombard street and Charing Cross branch offices, and (for the night mails) at several of the receiving houses in the East Central District, where the number of letters presented for registration is very large, the quadruple manifold book (No. 3) is used instead of the ordinary receipt-book, the first sheets forming the receipts for the public, the second the record to be retained, and the third and fourth the lists to be forwarded to the head office with the letters, the total number of letters being advised immediately below the last entry. (See No. 7.)

In all cases when the manifold form of entry is adopted, the registered letters are dispatched in a separate sealed bag, which is advised on the letter bill (No. 8) as "one registered bag" and forwarded inside the ordinary bag. An officer of the branch collects these registered letter-bags as soon as they reach the head office, and signs for each on the letter-bill. They are then ticked off in the arrival book, which contains a daily record of all the registered letter-bags due and their time of arrival. The bags are then distributed to and signed for by the officers at the opening tables, each of whom is furnished with a list (No. 9) of those which it is his duty to deal with. To facilitate this distribution each bag is marked with the "letter" of the table to which it belongs.

Each of the officers at the opening tables is provided with a dating stamp, a table-stamp, and with a blue-chalk pencil. As the bags are placed before him, he ticks them off on the list by his side, and then proceeds to open each separately—taking care to check the contents of one before opening another.

Having turned the bag inside out, to make sure that it is empty, he first looks to the advice of the total number at the foot of the counterfoil list, and ascertains by counting the letters that he has the full number advised. He next compares the address of each with its entry on the accompanying sheets. He then stamps the letters with the dated stamp and each entry on the sheets with his table-stamp. He also numbers each letter consecutively with his blue-chalk pencil, disregarding the red-chalk numbers of the dispatching office, and commencing with No. 1 for the first letter in the first bag he opens, and continuing the series unbroken to the last letter in his last bag, taking care to arrange the letters on his table in this order. He then marks the same number against the entry of the letter on each of the two sheets, which are designated respectively the "counterfoil" and "receipt" forms, and having recorded the total number of letters on his table-list, he retains the counterfoil sheets, and passes the receipt-forms to the stamping-table, when a dated stamp is affixed to them, and each sheet is separated into the eight separate portions of which it consists.

Any discrepancy or irregularity discovered by the opening officers is at once reported on forms No. 9, to the superintendent, and if there is any ground for supposing that a letter is missing, a telegram is at once sent to the dispatching office.

From the stamping-tables the receipt-forms are placed before the sorters, whose duty it is to sort them for the forty separate Divisions at which the letters are made up for dispatch. These Divisions consist of boxes for a certain number of towns, varying from two or three to thirty or forty (see Division list No. 10), according to the average number of letters for each place, and one officer takes charge of and dispatches all the letters for each Division. As the receipt-forms are sorted they are transferred to the officers at the respective Divisions, and each then proceeds to collect in his letters for dispatch. He first of all arranges his receipt forms according to the "table-letter" stamped on each, and signs the right-hand portion of each form, which is called the "tab." He then goes to the opening-tables, which are labeled in alphabetical succession, calls out the address of each letter he requires and its blue-chalk number, receives it from the opening officer, compares the address with the entry on the receipt, and hands him the tab in exchange for it—still retaining possession of the receipt-form. He places the letters in a wooden tray which he carries with him, and returns to his Division. Having sorted the letters, he enters those for each of the towns he makes up on a separate slip (Nos. 11 and 12) in his dispatch-book, places them in the proper partition of his Division, and alternately collects again and enters until he has ascertained that all the bags due have arrived and that there are no more letters for him. Whilst he is collecting he secures his letters at his Division by pulling down a movable shutter fitted in front of the boxes.

Having completed his entries, he totals and checks the letters for each town with them, detaches the duplicate list from his book, ties it up with the letters, and incloses them in a sealed bag. As soon as all his bags are made up he conveys them to the Inland Branch, where he obtains a signature for each from the officer who dispatches the ordinary correspondence for the respective towns, and who places it inside the ordinary bag, and advises it on the letter-bill.

He then returns to his Division, compares the entries in his book with those on the receipt-forms which he retained when he gave up the tabs in exchange for the letters, and having satisfied himself that he has an entry for each, he initials and ties up the receipts, and hands them to one of the superintending officers to be transferred to the checking officers.

The officers at the opening-tables having opened all their bags and given out all their letters, which the consecutive blue-chalk number enables them to do very rapidly, they proceed to check their tabs with their counterfoil, in order to make sure that they have obtained a discharge for every letter, and then tie them up inside the counterfoils they belong to, and the bundles, with their table-list, are passed to the officers employed to check and examine the vouchers.

The receipts for the letters for delivery in the East Central District are sent to that office to be sorted to the letter carriers attached to the respective walks, who then come into the registered-letter branch and collect their letters from the opening-tables, in the same way as the dispatching officers, leaving the tabs in exchange for the letters, and when they have obtained the signatures of the addresses to the receipt-forms, they deposit them in a locked box provided for the purpose, from whence they are transferred to the checking officers, to be examined and put away with the records of the letters.

At the Metropolitan District offices the letters registered at the various suboffices arrive entered on the postmaster's letter bills in the same manner as from the East Central receiving houses, and are re-entered for dispatch to the chief office, in one of the triplicate books (No. 2), in order to procure a record at the District office and the counterfoil and receipt-forms, for dispatch at one operation. The triplicate-book is for the same reason used at the Provincial head offices for all letters dispatched to the head office, London.

For those forwarded direct to the Metropolitan District Offices another book, of which

specimen No. 13 is a pattern, is used; those sent to the traveling post-offices and those dispatched by cross-post, or to the suboffices, are entered upon the ordinary letter-bill (No. 8).

For the re-entry of letters arriving for delivery the Metropolitan and Provincial head offices are furnished with the duplicate manifold-book (No. 1).

Letters received in the traveling post-offices for cross-post are entered on the letter bill (No. 8) and those for London are entered in triplicate as those from Provincial towns.

The arrangements for dealing with the letters for twenty-two of the principal London bankers and mercantile firms and the official remittances from the postmasters for the Receiver and Accountant-General are as follows:

Four officers are employed to collect the letters for bankers and business firms from the opening-tables, each taking only those for the firms allotted to him. The origin of each letter is then entered on a duplicate list (specimen No. 14), and one copy of the list is inclosed with the letters for each firm in a sealed bag. The bags are then signed for by two messengers, specially selected for the duty, and conveyed by them in mail-carts to their destination. A record-messenger accompanies each of the carts, to guard the remaining bags while the other is delivering them one by one.

A clerk is in attendance at each banking-house to receive the bag from the messenger and to give him a receipt for it on his way-bill (specimen 15). When the messengers have completed their rounds they wait at the last house until the contents of the bag delivered there has been checked, when the list accompanying them is signed by the clerk and given back to the messenger, who then returns on foot, calling at each of the other banks and firms for their lists, and brings them all back with his way-bill to the registered-letter branch, where they are at once examined and put away. No charge is made to bankers for this special delivery.

The official remittances, which average about three hundred daily, are collected by one officer, who is furnished with printed lists (No. 16), containing the names of all the offices having an account with the Department in alphabetical order. Against each office from which there is a remittance the officer places his initials on the lists, and then incloses them in a sealed bag with the lists pertaining to them, and advises the total number at the foot of the lists. The bags are then transferred to an officer who distributes the other official correspondence, and entered by him in his dispatch-book, after which the bags are taken by him to the Receiver and Accountant-General's Office and a signature obtained for them on the receipt-form detached from the book.

The official remittances from the Receiver and Accountant-General to the postmasters and letter-receivers are sent to this branch in a sealed bag, accompanied by counterfoils and receipt-forms for each, and are checked and dealt with in the same manner as the contents of any other registered-letter bag.

The letters for dispatch to places abroad are collected by the proper officers from the opening-tables and entered in the respective dispatch-books, which for all the principal colonial and foreign offices are constructed in duplicate (specimen No. 17), so that by inserting carbonic paper between the sheets one serves as a record to be retained and the other as the list to accompany the letters. Each officer collects only those letters which he dispatches; and for places to which the mails are not forwarded daily, the letters, after being entered, are accumulated in iron safes, to which the dispatching officers alone have access, until the date arrives for making them up.

The registered letters from places abroad arrive entered on the letter-bills or on lists. In either case, after being checked with the original entry by the officer who opens the bag, they have to be crossed with a blue pencil and re-entered in books prepared for the purpose (No. 18) in order to obtain a proper record of them and receipt-forms for their disposal.

The receipt of foreign and colonial registered letters, both inwards and outwards, except between countries in the Postal Union, is acknowledged, as regards the total number, on the back of the next list dispatched after their arrival (see back of form No. 17), and as regards those dispatched from this branch to the Metropolitan and Provincial offices, by the signature of the receiving officer across the entry of the registered bag on the letter-bill forwarded with the ordinary letters; the receipts taken on the delivery of the letters being retained at the delivering offices, and any discrepancy between the addresses of the letters and the entries on the list accompanying them being at once reported and rectified.

The checking officers' duties consist in examining the whole of the receipt-forms and "tabs" of the previous day to ascertain that they are properly signed and that a discharge has been obtained for every letter recorded on the counterfoils. To enable them to do this, all the counterfoils bearing the same table-stamp are fastened together in the order in which they have been numbered by the opening officer with his blue-chalk pencil, and the receipts and tabs are sorted in similar rotation. The checking officers then proceed to compare the receipts and tabs one by one with their counterfoils, noticing at the same time that each of the former bears a legible signature; and, if so, he marks them off by noting the date in the column provided in the counterfoil for

the purpose. If he misses a receipt, he records the particulars in a book and also on a printed form (No. 19), which is referred to the office from which the missing vouchers should be forthcoming; and when it is obtained, he records the date of its arrival and puts it away in the proper bundle. If he discovers any other irregularity, he reports it in writing, and the officer in fault is duly called to account.

When all the counterfoils have been checked they are tied up with the receipts and tabs belonging to them, and carefully labeled and put away, in order of date, being so arranged that in the event of any inquiry for a letter, the particular bundle in which a record of it should be found can be at once selected and referred to. The presses in which these records are stored are kept carefully locked, and no one is allowed access to them, except under the direction of one of the superintending officers of the branch. These vouchers are kept for three entire years and then destroyed.

It will thus be seen that, as regards the letters passing through the London head office, a thorough and complete hand-to-hand check exists for every letter, and that with the exception of foreign letters inwards, and those dispatched at the smaller receiving houses, this is effectually secured without the necessity for any re-entry simply by recording the addresses at the originating office either in duplicate, triplicate, or quadruplicate, by means of the manifold-books, as may be required to facilitate the disposal of the letters; also that at the Metropolitan and Provincial head offices the use of the duplicate and triplicate manifolds not only very considerably diminishes the necessity for re-entry, but at the same time provides a more reliable record than if the addresses were recopied each time the letters changed hands.

TELEGRAPHS.

I have inquired into the postal telegraph system only so far as to learn that the officers of the department, while expressing opinions cautiously, seem to think that although the control of the telegraph lines by the government has been beneficial to the public, it does not produce a satisfactory result from a financial point of view. The charge for transmitting messages has been reduced to one shilling for twenty words between any two points in the United Kingdom, and I believe that a further reduction is contemplated. So far as the public are concerned this is a great convenience and a great benefit, but the receipts do not pay a fair dividend upon the original cost of the lines added to the working expenses.

POSTAL SAVINGS BANKS.

The experiment of making the government the custodian of the people's savings appears to be entirely successful. The subject has been so thoroughly discussed and the statistics concerning it are so readily found in official reports, that I have not considered it worth while to make any extended investigation of the matter. It is only necessary to say that the system is regarded by the public with great favor, as affording an entirely safe investment for their earnings, and its operations have thus far been entirely satisfactory to the government.

DEAD LETTERS.

In addition to the Returned-Letter Branches in London, Glasgow, and Dublin, there are returned-letter offices in seven of the largest provincial towns, each covering a certain district, and altogether embracing in their operations one hundred and seventy two towns.

From these offices letters which are undeliverable are returned to the writers without being forwarded to the central office. The total number sent during the last year to the returned-letter offices, together with those returned to the writers direct from the London district offices, was 4,873,625, or one out of two hundred and seventeen letters transmitted.

The object of this subdivision of the dead-letter office is to insure greater promptness in the return of undeliverable matter. It is difficult, however, to see how this can be effected by such a system, and it should render necessary a considerable increase of clerical force, and I should think would result in some confusion.

THE FRENCH POSTAL SERVICE.

The organization of the French postal service is similar to that of the British service, except in the matter of appointments, which will be explained hereafter.

The territory of France for judicial, administrative, and police purposes is divided into eighty-six departments, each of which is presided over by a Prefect, who has the general supervision of all governmental affairs therein. In each of these departments the management of the postal business is intrusted to a Director, who, in conjunction with the Chief Postmaster of the department, is held responsible for the efficiency of the service.

The functions of the Directors are substantially the same as those of the British Surveyors, except that the former are mere administrative officers and are not invested with so much discretion as the latter.

The accounts of the postmasters are submitted to the Chief Postmaster, by whom they are, after examination, forwarded to the Director. The Director then prepares a consolidated account or *résumé* of all the accounts for the department, which is sent to the Central Administration at Paris, which consequently has but eighty-six accounts to audit instead of nearly six thousand as would be the case if postmasters reported directly to the Central Administration. Requisitions for supplies and all communications from postmasters relative to the details of the service are addressed to the Directors, and, if necessary, referred to the Central Administration.

Each Director has of course his own staff of clerks, Inspectors, and Sub-Inspectors.

In addition to the departmental Directors there are eight Directors for the *Postes Ambulantes* or traveling post-offices, whose duties correspond to those of our assistant superintendents in the railway-mail service.

CENTRAL ADMINISTRATION.

The Central Administration is admirably organized. It consists of four grand divisions each in charge of an *Administrateur* or Assistant Postmaster-General, and each consisting of two or more bureaux. The duties of each bureau are defined with great precision and explicitness in the *Annuaire des Postes*, to which I refer for details.

Before the establishment of the Republic, the head of the postal service was a Director-General. Shortly afterward the department was placed in charge of an Assistant Secretary of Finance. Recently, however, the law provided for the appointment of a minister of postal affairs, who takes rank with other Cabinet ministers, and whom for convenience I shall designate as the Postmaster-General.

APPOINTMENTS.

The officers and employés of the French postal service are divided into two grand classes, viz: Agents and Sub-Agents. The former includes all superior officers, clerks, and postmasters; the latter embraces all subordinate employés, such as carriers, messengers, watchmen, laborers, &c. Appointments in all grades of which the salary is one thousand francs and upward are made by the Postmaster-General, generally upon the nomination of the Director of the department in which the vacancy exists. Where the salary is less than one thousand francs, appointments are made by the Prefect of the department. All appoint-

ments are made "for life, or during good behavior," and no removals are made except for gross neglect of duty. Even during the great political changes to which the government of France has been subjected during the past few years, there seems to have been no thought of changing the *personnel* of the different departments, except in a few isolated cases where individuals had made themselves unpleasantly conspicuous by violent opposition to the existing government.

Minor infractions of discipline are punished by reprimands, stoppage of leave, fines, or reduction of rank and pay; and dismissal from the service is resorted to only when the subject is incorrigible.

One singular feature of the French service is the appointment of a class of employés called Supernumeraries. They are assigned to duty as clerks, &c., but receive no pay until a vacancy occurs in the grade in which they are serving, or to which they are eligible, when they receive a permanent appointment. It frequently happens that a Supernumerary serves for several years without salary. For an appointment as Agent as well as for that of Supernumerary a preliminary examination is required, and after three years' service an Agent is eligible to promotion, subject, however, to a second examination, the scope of which depends upon the position to which the applicant aspires. For the Sub-Agents no examination is necessary, and except in rare cases promotions are not made from this class to that of Agents. As a general rule appointments in the class of Sub-Agents are reserved for discharged soldiers, widows or children of deceased soldiers, or persons who have been teachers in the public schools.

The following general outline of the rules governing appointments is compiled from the Book of Regulations, published by the Central Administration, which is a model of conciseness and explicitness:

RULES GOVERNING APPOINTMENTS.

Applicants for appointment as Supernumerary must be of French birth, not less than eighteen and not more than twenty-five years of age. From the operations of this rule, however, the following persons are exempted, viz, applicants between the ages of twenty-five and thirty years who have served for five years either in the army or navy, or as teachers in the public schools, or who have been employed in a subordinate capacity for three years in the postal service. No person not previously employed in the postal service in some capacity can be appointed: First, to the position of postmaster before the age of twenty-five years nor after the age of thirty-five. If the applicant has already been permanently employed under salary the limit of thirty-five years may be extended so far as to cover the time that he has been so employed, but not even in such a case must the age of the applicant exceed forty-five years. Second, to the position of carrier or assistant in an office, under the age of eighteen years or over the age of thirty, unless previously employed in the service as above specified, in which case the maximum age is extended to forty years. Assistant mail-route messengers, local agents, and other employés who are charged with the manipulation of the mails cannot be appointed before reaching the age of eighteen. Upon the recommendation of the Directors the maximum age may be extended in exceptional cases to forty years for carriers.

Appointments to post-offices of which the annual salary does not exceed one thousand francs are reserved under the above-mentioned conditions as to age, for—

First. Persons who have served the government in either a military, naval, or civil capacity for at least seven years, or who have been honorably discharged from such service by reason of wounds received or disability incurred in the discharge of their duties.

Second. The wives, daughters, and sisters of men who have served at least ten years.

Third. The wives, daughters, and sisters of men who have died in active service.

Fourth. "Distributors" (an inferior grade of postmasters) who have been three years in the postal service.

Fifth. Supernumeraries who have served seven years and the wives, daughters, and sisters of such employés who have served at least ten years.

Sixth. Persons who have served five years in charge of any office, or five consecutive years as the sworn Assistant in an office, and who possess a knowledge of telegraphy.

For an appointment as Distributor the only requisite is that the applicant shall be of the legal age. Letter-carriers must in no case be relatives or connections of the postmasters or chief clerks of the offices to which they are attached.

No one can be appointed to one of the following positions, viz, Director, Controller, Chief or Sub-Chief of division, Postmaster of the first and second class, or Translator in the Central Administration without submitting to a special examination, nor unless he has been for at least three years on the permanent roll of the department. A candidate for promotion who has failed in such an examination may demand a second trial.

Officers who were in the service prior to January 1, 1864, are not required to be examined for promotion, but may demand it if they choose.

SALARIES.

Salaries in all grades below that of Postmaster-General are very meager as compared with those paid to employés either in the British or United States service.

Following is a complete list of all employés in the French service with the different grades assimilated as nearly as possible to corresponding positions in the United States service. It will be seen that salaries increase with length of service, although incumbents may not in the mean time have been promoted to higher grades. In the French service, as in the British, and indeed in the service of all European countries, it seems to be taken for granted that experience is worth something, and that a clerk or other employé who has served for several years renders more valuable service to the government than a new beginner, and should be compensated accordingly. It should also be noted that in addition to the regular salaries, special allowances are made for night service, for extra duty, and for additional expenses caused by being assigned to duty away from the permanent residence of persons so transferred. Postmasters of all classes are required to live in the building in which their offices are situated, but the rent is paid by the government, which is a very important item, and virtually adds considerable to the nominal salary. For this purpose the appropriation last year was 3,055,170 francs. A liberal allowance is also made for uniforms to such employés as are required to wear them.



Number and salaries of all grades exclusive of the telegraphic service.

CENTRAL ADMINISTRATION.

Number.	Personnel.	Salary per annum.
		<i>France.</i>
1	Postmaster-General	50,000
4	Assistant Postmasters-General	12,000 to 15,000
31	Chiefs of bureaux	4,500 to 9,000
168	Clerks of all classes	1,600 to 4,000
33	File-clerks	1,000 to 2,200
40	* <i>Gardiens de bureaux</i>	1,000 to 1,800

* No corresponding officers in the United States postal service.

DEPARTMENT OF THE SEINE, INCLUDING THE PARIS POST-OFFICE.

1	Director	12,000
1	Chief Inspector	5,000 to 8,000
10	Inspectors and sub-inspectors	3,500 to 5,000
1	Chief postmaster	10,000
64	Postmasters	2,500 to 4,500
50	Postmasters	1,000 to 2,200
6	Chiefs of sections	5,000 to 8,000
20	Sub-chiefs of sections	3,500 to 4,500
285	Principal clerks	2,700 to 3,300
563	Ordinary clerks	1,200 to 2,400
42	<i>Agents secondaires</i>	1,000 to 2,000
12	Head letter-carriers	1,000 to 1,800
1,809	Letter-carriers	1,000 to 1,800
175	<i>Gardiens de bureaux</i>	1,000 to 1,800

PROVINCIAL SERVICE.

85	Directors	6,000 to 10,000
144	Inspectors and sub-inspectors	3,000 to 5,500
5,666	Postmasters	800 to 8,000
8	Postmasters in foreign countries	2,500 to 6,000
4,680	Clerks	1,200 to 3,300
7	Clerks in foreign offices	1,500 to 2,400
32	Mail-agents on ships	1,500 to 3,300
116	Head carriers	1,000 to 1,800
2,189	City carriers	800 to 1,200
237	Collecting carriers	600 to 750
19,072	Local and rural carriers	400 to 900
362	<i>Gardiens de bureaux</i>	800 to 1,800

RAILWAY MAIL SERVICE.

8	Directors	5,000 to 7,000
10	Inspectors and sub-inspectors	3,500 to 4,500
2	Superintendents of material	1,500 to 5,500
179	Chief head clerks	2,700 to 3,300
106	Chief clerks	2,400
588	Ordinary clerks	1,200 to 2,400
422	Mail-route messengers	1,000 to 1,800
517	Miscellaneous employes	1,000 to 1,800

PENSIONS.

All persons who have been permanently employed in the postal service, except assistant mail-route messengers and *Gardiens d'Entrepôt* (employés for whom there is no corresponding designation in English), are entitled to pensions upon their retirement, under the following conditions, viz :

The right to retirement with a pension is ordinarily acquired at sixty years of age and after thirty years of service, but employés in the "active service" (which includes carriers of all classes, mail-route messen-

gers, and porters) may be retired at the age of fifty-five years, after twenty-five years of service, fifteen of which have been in the "active service."

Any period of service in the army or navy is credited as part of the time required to establish the right to a retiring pension, but such military or naval service cannot be deducted from the period of fifteen years required in the "active service." Pensions are granted without reference to age or length of service to employés who become permanently disabled while engaged in specially hazardous service or while assisting a fellow employé whose life is endangered.

The amount of pension is based upon the average of salaries received during the last six years of service, and consists of one-sixtieth of such average for each year of service. After twenty-five years of "active service," the pension is one-half the average annual salary with the addition of one-fiftieth for each year above twenty-five. In no case, however, can the amount of pension exceed three-fourths of the average salary of the recipient.

The following table shows the maximum pension allowed for different grades:

Salaries.	Maximum pension.
1,000 francs or less	750 francs.
From 1,001 to 2,400 francs	Two-thirds off the average salary, in no case less than 750 francs.
From 2,401 to 3,200 francs	1,600 francs.
From 3,201 to 8,000 francs	One-half the average salary.
From 8,001 to 9,000 francs	4,000 francs.
From 9,001 to 10,500 francs	4,500 francs.
From 10,501 to 12,000 francs	5,000 francs.
Above 12,000 francs	6,000 francs.

The widow of an employé entitled to a pension receives *one-third* of the same, provided she was married six years before her husband's service terminated.

The widow of an employé who loses his life in the performance of his duty receives *two-thirds* of the pension to which he would have been entitled. In case the widow is in any way disqualified to receive the pension it reverts to the minor children of the deceased and is payable up to the time that the youngest child attains the age of twenty-one, the portion of such as may die or attain their majority in the mean time being divided among the others.

To constitute a permanent fund for the payment of pensions, the following deductions are made from the salaries and allowances of employés:

First. Five per cent. of all regular salary and allowances (other than for expenses) paid in any grade.

Second. One-twelfth of the first year's salary, and of any subsequent increase.

Third. All fines and stoppages made on account of absence or by way of punishment.

REGISTRATION.

Registered matter in France is divided into two classes: First, ordinary letters and packages; second, letters and packages of declared value.

For ordinary matter the fee is twenty-five centimes (five cents) in addition to the regular rate of postage.

For matter of declared value, a distinction is made between letters and packages. For letters there is, in addition to the registration-fee, a charge of twenty centimes for each one hundred francs of value or fraction thereof. For other packages the rates, in addition to the postage, are, first, a charge of 1 per cent. of the value up to one hundred francs, and, second, a fixed charge of fifty centimes for each one hundred francs or fraction thereof.

For the loss of an ordinary registered package the fixed sum of twenty-five francs is paid; for that of a package of declared value the full amount, up to the limit of ten thousand francs, is paid, except when the loss is the result of *vis major*. There is no limitation in regard to weight, but packages must not exceed ten centimeters in length, eight in width, and five in depth.

The only distinction made between the treatment of ordinary registered matter and that of declared value is that the latter must be fastened with five wax seals, while for the former the ordinary method of inclosure is sufficient.

No special form of envelope is used, and registered matter is only distinguished from other mail-matter by having impressed on it a peculiar stamp.

The mode of handling this class of matter is as follows:

The postmaster first compares his registered mail with the stubs of his receipt-book, and the packages are tied out, each inclosed with a way-bill describing its contents (which must be verified by two other persons), enveloped in wrapping paper, sealed and labeled either to the office of destination or the traveling post-office, as the case may be. The way-bill is copied into a register, its correctness attested as in case of the original, and the packages dispatched with other mail in an ordinary bag, which is tied and sealed with wax. No leather pouches or locks are used. Upon arrival at the office of destination the way-bill is compared with the contents of the package, and if found correct, the postmaster, after having it verified by two employes, puts his stamp upon it and files it for future reference. If an error is discovered it is reported immediately to the Central Administration.

If, instead of being mailed in a "direct bag," the package is addressed to a traveling post-office, the same course is followed, i. e., the head clerk checks and files the way-bill, and after making his distribution of the letters received, makes them up into packages, and makes out a new way-bill for each package. In every case the correctness of the way-bill must be attested by two persons besides the responsible officer.

This system appears to afford an excellent guarantee against losses, but also to entail a great deal of labor upon the railway clerks. I was informed by the head clerk of the traveling post-office on the line between Paris and Erqueline, Belgium, that on his "runs" from Paris he usually made about two hundred bills.

The only receipts ordinarily given for a registered letter are that given by the mailing postmaster to the sender and that given by the addressee to the carrier upon delivery.

If, however, the sender desires a receipt from the addressee it can be obtained by the prepayment of ten centimes (two cents).

The following tables relative to the registry business will be found interesting. From them it will be seen that while the percentage of loss viz, one piece out of 133,582 +, has not been reduced as low as in the British service, it is still very much smaller than in the United States.

Table showing the number of pieces of registered matter of all classes mailed in France during the years 1877 and 1878.

Year.	Ordinary.	Declared value.	Amount of value.	Total number.
			<i>France.</i>	
1877.....	4,535,000	1,562,000	679,552,000	6,297,000
1878.....	4,830,000	1,562,000	740,845,000	6,412,000

Table showing increase in the number of registered pieces mailed during the first quarter of the year 1879, as compared with the corresponding quarter of 1878, attributed to reduction of registration fee from fifty centimes to twenty-five centimes (five cents.)

1879. Number of pieces mailed.....	1,373,400
1878. Number of pieces mailed.....	1,231,320

Increase 142,080 or 11.54 per cent.

1879. Estimated loss for year consequent upon reduction of fee...10,000,000 francs.

Registered pieces received at the dead-letter office during the years 1877 and 1878.

Year.	Ordinary.	Declared value.	Total.	Returned.
1877.....	1,134	45	1,179	294
1878.....	1,177	50	1,227	310

Number of pieces of registered matter lost during the years 1877 and 1878, with amounts paid in reimbursement for such losses.

Year.	Ordinary.	Declared value.	Total.	Amount of reimbursement.
				<i>France.</i>
1877.....	30	15	45	8,390
1878.....	28	20	48	18,900

MONEY-ORDERS.

For sums of three hundred francs and under, money-orders are not drawn upon any particular office, but are payable at any post-office upon presentation with proof of identity. For this purpose the letter transmitting the order is generally sufficient, but the paying postmaster may require additional evidence if he deems it necessary.

For larger sums the orders are drawn upon designated offices, which are notified by letter of advice. In no case is a money-order transferable, nor is there any process by which it can be paid to any other person than the one in whose favor it is drawn.

The fee for domestic orders is 1 per cent. and for foreign orders 2 per cent. (in even *sous*) of the amount drawn for.

There is no restriction as to the amount for which orders may be drawn, but practically the fees operate as a limitation on the amount, few persons being willing to pay 1 per cent. on large amounts.

In issuing orders the order itself is handed to the purchaser with a stub attached, which he retains as a voucher to be used in case the original order should be lost, and a similar stub is retained by the postmaster from which he makes up his office records. Between this latter stub and the order is printed a series of figures. In clipping off the

order it is so cut that a number of figures, the sum of which (in even francs) equals the amount drawn for, are left attached to the order, while the remaining figures of the series remain on the stub.

This method seems to guard effectually against any alteration of the amounts drawn for, and greatly facilitates the examination of accounts. The stubs are retained as vouchers by the postmaster for a period of eight years, after which they are destroyed.

In the sub-offices in Paris and in the larger cities a certain amount of the money arising from the fees paid is retained for the payment of orders presented, and the balance is remitted daily to the departmental treasury; in the smaller offices remittances are not made at regular periods, but only when the surplus exceeds a certain amount.

Money accounts are rendered semi-monthly, and the orders paid during the time covered by the accounts are filed therewith.

In further explanation of the system, I submit copies of the forms used in connection therewith, which were kindly furnished by the French officials.

POST-OFFICES AND POSTMASTERS.

Post-offices in France are divided into two kinds, viz : *bureaux simple* and *bureaux composé*. The former is one in which the postmaster is the only person employed who is on the permanent list of the department. Postmasters of this class of officers are mostly women and receive salaries ranging from eight hundred to sixteen hundred francs per year. They are sometimes allowed an assistant at a salary of from four hundred to six hundred francs, generally the son or daughter of the incumbent, but such assistant is not considered as a permanent employé and is consequently not eligible to promotion.

A bureau composé is one in which several clerks are employed. There is also a class of suboffices presided over by a *distributeur*, whose functions are the same as those of the inferior postmasters, but who reports and is accountable to some postmaster designated by the Central Administration.

Salaries of postmasters are adjusted chiefly on the basis of the receipts of their offices, but not by any calculation of percentages, and not subject to any provision of law except that the gross amount allowed for salaries cannot exceed the sum appropriated for that item.

Salaries are retained from the receipts of the offices, but it is necessary that special authority for such retention be obtained each month from the Director of the department, who, before granting such authority, examines the accounts of the office.

RAILWAY SERVICE.

The method of distribution on the mail trains is quite similar to that employed in our own service, but, as in England, much of the mails for small offices goes into distributing post-offices.

No route-maps are furnished to the railway postal employés, but instructions relative to the distribution are imparted by means of printed "schèmes," which are bound in book-form.

The traveling post-offices are about twenty-four feet in length with doors at the sides, as is customary for all railway carriages of Europe. On a few lines where two or more cars are used, there are communicating doors between the cars at the ends. The cars are fitted up with boxes at the sides and ends, but no provision is made for the storage of

bags; consequently they are piled upon the floor, where the clerks are obliged to climb over them in performing their work.

On each of the main lines leaving Paris there are ordinarily dispatched two postal cars daily, one in the morning and one in the evening. The principal mails are dispatched on the evening trains, which leave at about eight o'clock. Much of the distribution on these trains is made before their departure. For instance, on the line from Paris to Erquelines, Belgium, bags begin to arrive from the different local offices in Paris at about 3.30 p. m. and continue to be received from that time up to 8 p. m., the hour of departure, the clerks in the mean time being kept busy in sorting.

For comfort and convenience the cars will not bear comparison with those in our service. They are, as heretofore indicated, much smaller than ours, with imperfect means of ventilation and with no provision for heating in cold weather. I carefully inspected several of them in which the clerks were at work, and found them exceedingly uncomfortable. At the time of my visit the weather was so cold as to require the wearing of an overcoat, but from six to eight clerks were employed in each car, and the animal heat engendered by them added to that caused by the lamps used for lighting the cars was so great as to cause a profuse perspiration.

DEAD LETTERS.

The organization of the Dead Letter Office in Paris is similar to that of our own. An effort is made to return all undeliverable letters to the writers, and when the postage has not been prepaid the writers are required to pay double rates.

Ordinary letters are retained in the office one month, and those addressed "*Poste Restante*" two months after the month in which they are received; after that time they are sent to the paper-mill. Letters containing valuables are, unless the owners are found, retained seven years, at the expiration of which time the contents are forfeited absolutely to the government.

DEPREDACTIONS AND SPECIAL AGENTS

From the remarkable police system which exists in France one would naturally expect that the Post-Office Department would have in its service a trained corps of detectives and other officers for the tracing of losses and the correction of irregularities, all under one chief. This is, however, not the case.

There is a force of inspectors and subinspectors numbering one hundred and forty-four men, whose functions are substantially the same as those of our special agents, but instead of being united in one body, and therefore working under one direction, they are distributed among the different *departments* under the direct control of the departmental directors.

Instead of reporting all losses or other complaints to the Central Administration, each director is charged with the investigation of cases arising in his own *department*, and generally employs only his own inspectors.

When a director desires to avail himself of the services of the police he must apply to the *Procureur* (District Attorney) of his *department* for authority.

The system of "locating" losses in our service and of placing all the Special Agents under one management, seems to me much more effective, although on account of the differences in the service which exist in the

two countries, the French system may answer well enough in France. It certainly would not in this country produce as good results as our own.

REVENUES AND EXPENDITURES IN ENGLAND AND FRANCE.

For the year 1877-'78 the receipts of the British Post-Office (including the Telegraph Service) were £6,047,000; the expenditures, £3,991,000; leaving as a net income the sum of £2,056,000.

In France during the year 1876, the latest date for which I have been able to obtain figures, the receipts were 116,707,852.11 francs; the expenditures, 71,090,994.96 francs; and the net revenue, 45,616,857.15 francs.

From these data the inference may be drawn that the postal service is more economically administered in the countries named than in the United States; but I do not believe that the facts will warrant any such conclusion.

Aside from the fact that the immense extent of territory supplied by the postal service in the United States renders the proportionate cost much greater, a cogent reason for the annual "deficiency" with which our service is charged may be found in the exceedingly liberal rates prescribed by Congress for matter other than first-class, and especially for newspapers and other periodicals.

In England there are but three classes of domestic mail-matter, viz:

First. Letters and sealed packages on which the postage is as shown in the following table, viz:

For a letter not above 1 oz.	1 d.
" above 1 oz. but not above 2 oz.	1½ d.
" " 2 oz.	2 d.
" " 4 oz.	2½ d.
" " 6 oz.	3 d.
" " 8 oz.	3½ d.
" " 10 oz.	4 d.

A letter above the weight of 12 oz. is liable to a postage of 1d. for every ounce, beginning with the first ounce. Thus, a letter weighing between 14 and 15 oz. must be prepaid 1s. 3d.

A letter posted unpaid is chargeable on delivery with double postage; and a letter posted insufficiently prepaid is chargeable with double the deficiency.

No letter may be above 18 inches in length, 9 inches in width, or 6 inches in depth, unless it be sent to or from one of the government offices.

Second. Newspapers, on which the postage is one half-penny for each copy; and where more than one copy is mailed in one package, one half-penny for each two ounces or fraction thereof in addition, without reference to the distance carried; and

Third. Packages sent by "Book Post," which includes books, circulars, printed matter other than periodicals, maps, drawings, engravings, &c., and on which the postage is one half-penny for each two ounces or fraction thereof.

Supposing the average weight of newspapers to be two ounces, it will be seen that the post-office realizes not less than eight cents per pound, or four times the rate charged in the United States for such newspapers as do not pass through the mails free.

In France, the letter rates are the same as in this country, and there are five classes of mail-matter admitted at less than letter rates, as follows, viz:

First. Newspapers and other periodicals, published not less than once in three months. On these the rates are as follows, viz: For each copy sent beyond the *department* in which it is published and beyond the *departments* adjoining, two centimes* for the first twenty-five grammes† (a little less than one ounce) and one centime for each additional twenty-five grammes or fraction thereof.

If published in the department of the *Seine* or of the *Seine et-Oise* and not sent beyond the limits of the adjoining departments, one centime for the first twenty-five grammes and one half-centime for each additional twenty-five grammes or fraction thereof.

If published in departments other than the two above named, and not sent beyond the adjoining departments, one centime for the first fifty grammes, and one half-centime for each additional twenty-five grammes or fraction thereof.

Second. Circulars, prospectuses, catalogues, books, price currents, engravings, lithographs, &c. On this class the rates are: For the first five grammes or less, one centime; from five to ten grammes, two centimes; from ten to fifteen grammes, three centimes; from fifteen to twenty grammes, four centimes; from twenty to fifty grammes, five centimes; and for each additional fifty grammes or fraction thereof, five centimes.

Third. Samples of merchandise (with which bills may be inclosed), for the first fifty grammes or less, five centimes, and five centimes for each additional fifty grammes or fraction thereof.

Fourth. Book manuscript, corrected proof-sheets, plans, commercial and legal papers not having the character of personal correspondence, the same rates as third class.

Fifth. Photographs, business cards, prospectuses, circulars, &c., inclosed in unsealed envelopes, five centimes for each fifty grammes or fraction thereof on each package bearing an address.

It will be seen from the above that the lowest rate of postage on newspapers is about the same as our bulk rates, while the highest is about four times as great, and as the number of provincial papers (to which the lowest rates are applicable) is very small, the average rate is much higher, while no papers are sent free. The result is a much larger revenue, in proportion to the weight carried, than in the United States.

CONCLUSIONS.

With the exception of one or two special branches of the service, I have in the foregoing sketch attempted to give only general outlines. I have, however, brought with me many documents, reports, blanks, &c., from which can be obtained full explanations in regard to many details which I have not mentioned or to which I have referred only casually.

I have paid but little attention to the system of free delivery, for the reason that a very thorough and comprehensive report on that subject was made by General Daniel Butterfield in the year 1873, to which I am unable to add anything of importance.

In what I have written it will be observed that I have seldom given any opinion as to the merits of any features in the service of the countries visited. I have preferred to simply submit the results of my observations, leaving to the officers of the department who are charged with the execution of its various details to make comparisons, and to

* 5 centimes are about equal to 1 cent.

† 28½ grammes equal 1 ounce.

judge whether our own service can be improved by the adoption of the methods of the foreign service which are different from ours.

There is one matter, however, which I think deserves special attention, viz, the almost absolute

SAFETY OF REGISTERED MATTER IN FRANCE AND ENGLAND.

After considerable study of the systems of guards and checks in use in those countries, they do not impress me as being in any way superior to, while they seem more complicated and laborious than our own. It remains, therefore, to seek some other reason for the disproportion in losses.

In the first place, it should be remembered that the number of miles of railway in the United States exceeds by several thousand that of all Europe, and that our mails are in many cases while in transit over many of the lines in charge not of postal officials but of employés of the railway companies.

It should also be remembered that we have more than two hundred thousand miles of wagon, stage, and horseback routes, many of which run for great distances through wild and lonely sections of country where the mails are constantly liable to attacks by hostile savages, or still more dangerous "road agents."

Nor should it be forgotten that there are in this country more than twice as many post-offices as in England and France combined, and that in very many instances they are necessarily placed in charge of persons who are grossly ignorant of their duties. With these facts in view, it is not singular that the proportion of losses should be much greater here than abroad. I am persuaded, however, that one very good reason for the superior safety of the mails in the European service may be found in the fact that officials, by being appointed "for life or during good behavior," are removed from many temptations that beset our employés, and that the system of promotions, retirements, and pensions, not only lessens the probability of dishonesty, but has a tendency to secure more strict attention to duty and greater familiarity with detail.

When an employé knows that his retention and advancement in the service depend, not upon political or partisan favoritism, but upon the faithful and strict performance of duty, he has an inducement to be honest and efficient that does not and cannot exist in our service.

I should not like to be understood as disparaging either the honesty or ability of our own officials. On the contrary, I firmly believe that the great majority of them, and especially of those in the subordinate grades, are naturally quite as honest as, and superior in intelligence and education to, those of any European country.

Considering the vast extent of country supplied by our postal service, and the many difficulties under which it labors, I believe it will compare favorably for promptness and efficiency with that of any other country, and that all that is needed to make it the best in the world is to give to it the element of permanency.

I should be guilty of gross ingratitude if I failed to acknowledge the many courtesies extended to me by the French officials. Upon presenting myself at the department I was very cordially received by Mr. Besnier, *administrateur* of the division of foreign mails, who assured me that the entire department was at my service, and he had the kindness to relieve from all other duty and detail for my benefit an exceedingly competent and well-informed clerk, with instructions to consider himself as entirely at my disposal for so long a time as I should desire.

To this gentleman, M. Léon Foucault, I am indebted for nearly all of the information, and for all of the documents, reports, &c., which I obtained relative to the French postal system.

I am also under great obligations to General E. F. Noyes, United States minister at Paris, and to General Lucius Fairchild, consul-general, both of whom were of great service to me.

Very respectfully, your obedient servant,

W. A. KNAPP,
Chief Clerk.

Hon. D. M. KEY,
Postmaster-General.

LOTTERY LETTERS IN THE MAILS.

OPINIONS AND ARGUMENT

OF THE

ASSISTANT ATTORNEY-GENERAL

FOR THE

POST-OFFICE DEPARTMENT.

LOTTERY LETTERS IN THE UNITED STATES MAILS.

OFFICE OF ASSISTANT ATTORNEY-GENERAL
FOR THE POST-OFFICE DEPARTMENT,
November 18, 1879.

SIR: I have the honor to transmit herewith the various opinions of this office upon the subject of lottery letters in the United States mails, together with the argument made by the Assistant Attorney-General for the Department at Louisville, in the United States circuit court, in the suit brought by the Commonwealth Distribution Company of Louisville against the postmaster of that city.

Very respectfully,

A. A. FREEMAN,
Assistant Attorney-General for the Post-Office Department.

Hon. D. M. KEY,
Postmaster-General.

LOTTERIES.—*Section 3894 Revised Statutes, 2d ed., includes “legal” lotteries, notwithstanding parenthetical insertion into text of “and illegal.”*

OFFICE OF THE ASSISTANT ATTORNEY-GENERAL
FOR THE POST-OFFICE DEPARTMENT,
Washington, D. C., September 15, 1879.

SIR: The letter of F. W. Schaurte, special agent of the Post-Office Department, of the 9th instant, referred by you to this office, has been duly considered.

You submit the question whether the word “illegal,” italicized in brackets, before the word “lotteries,” in section 3894 Revised Statutes of the United States, 1878, forms part of the law now in force.

I answer, that in my opinion it does not constitute part of the existing law, nor in any manner qualify the amendment made by the second section of the act of July 12, 1876, to the act of June 8, 1872, “by striking out the word ‘illegal’ in the first line of said section,” 3894.

It is probable that the commissioner appointed to prepare and publish the new edition of the volume of the Revised Statutes of the United States inserted the word “illegal” in an attempted compliance with the provisions of the second section of the act of March 2, 1878 (R. S. 1878, p. 1092), so far as they are applicable, intending to show the amendment made by the second section of the act of July 12, 1876, to the act of June 8, 1872, “by striking out the word ‘illegal’ in the first line of said section,” 3894.

But whether this intention, made apparent by the printing of the word “illegal” italicized in brackets, would control the effect of its actual insertion in the text of the statute is rendered of no practical moment by the provision in the act of March 9, 1878 (R. S. 1878, p. 1093), which amends the act of March 2, 1877, so that section 4 of the last-named act,

qualifying the conclusive effect of the "new edition" of the Revised Statutes as evidence, now reads:

And when the same shall be completed, the said secretary shall duly certify the same under the seal of the Secretary of State, and when printed and promulgated as herein provided, the printed volume shall be legal evidence of the laws therein contained, in all the courts of the United States and of the several States and Territories, but shall not preclude reference to, nor control, in case of any discrepancy, the effect of any original act as passed by Congress since the first day of December, eighteen hundred and seventy-three.

Now, "the effect of the original act as passed by Congress" July 12, 1876, is, "That section thirty-eight hundred and ninety-four of the Revised Statutes be, and the same is hereby, amended by striking out the word 'illegal,' in the first line of said section," so that the section as in force reads thus:

No letter or circular concerning lotteries, so-called gift concerts, or other similar enterprises, offering prizes, or concerning schemes devised and intended to deceive and defraud the public for the purpose of obtaining money under false pretences, shall be carried in the mail, &c.

Very respectfully,

A. H. BISSELL,

Acting Assistant Attorney-General, Post-Office Department.

D. B. PARKER, Esq.,

Chief Special Agent, Post-Office Department.

Lottery letters, when addressed to lottery companies, or to agents, as such, can neither be mailed nor registered.

OFFICE OF ASSISTANT ATTORNEY-GENERAL

FOR THE POST-OFFICE DEPARTMENT,

Washington, D. C., October 4, 1879.

SIR: Your communication of the 2d instant presents the following question:

Whether letters addressed to a lottery company are to be registered on application, notwithstanding the provisions of section 226 Postal Laws and Regulations, and Revised Statutes 3894.

The act of Congress of June 8, 1872, was in the following words:

No letter or circular concerning illegal lotteries, so-called gift-concerts, or other similar enterprise, offering prizes, or concerning schemes devised and intended to deceive and defraud the public for the purpose of obtaining money under false pretences, shall be carried in the mail. Any person who shall knowingly deposit or send anything to be conveyed by mail in violation of this section shall be punishable by a fine of not more than five hundred dollars, nor less than one hundred dollars, with costs of prosecution.

This act was amended by the act of July 12, 1876, by striking out the word "illegal," thus making the prohibition to extend to all lotteries, both legal and otherwise.

In the Revised Statutes, edition of 1878, the word "illegal" is retained, inserted in brackets, this being the form used by the commissioner to indicate that portion of the statute which had been repealed. The law as it exists now, therefore, declares that "no letter or circular concerning lotteries * * * shall be carried in the mail."

Mr. Attorney-General Taft, in his letter to the Postmaster-General, under date of March 3, 1877, discussing this question, says:

Having given the subject that consideration which the amount of the pecuniary interest affected and the respect to be shown to corporations sanctioned by State legis-

lation required, I cannot see how Congress could have more explicitly declared a purpose to deprive of mail privileges *all* lottery letters and circulars, without regard to character or charters of the lotteries, than it did by striking out the limitation previously found in the word "illegal." There can, therefore, be no question that the transmission of either circulars or letters concerning lotteries is prohibited by law; but the difficulties surrounding this case grow out of an inadequacy of the means of enforcing the statute, as far as it relates to sealed letters.

The fact having been determined that a letter in any given case concerns a lottery, its exclusion from the mails follows as a matter of law. But how is that fact to be determined? One thing is settled, it cannot be done by reference to the contents of the letter. That is sealed against inspection, and neither the postmaster nor any other agent of the government is authorized to break the seal.

The provision under consideration is taken almost literally from the thirteenth section of the act approved July 27, 1868, which was the first act of Congress prohibiting the use of the mails in the transmission of letters or circulars concerning lotteries, and in construing this act Mr. Attorney-General Evarts, in an opinion addressed to the Postmaster-General, under date of December 7, 1878, says:

I have had the subject of those inquiries under serious consideration, but have found it quite impossible, in the present state of the postal laws, to develop or define any rules which would furnish safe guidance to the postmasters of the country in attempting to enforce the prohibition of the statute, in the various cases that may arise of supposed infringement of its provisions.

The acts are, of course, unrepealed and unaffected by the statute of 1868. While it may be lawful for a postmaster to detain and refuse to deliver a letter or circular within the prohibition of that statute, it is unlawful for him to detain or delay any letter which is not in fact within that prohibition, unless otherwise subject to detention, and he would be liable to indictment, and to a private action by the party aggrieved, for refusing to deliver a letter, otherwise competent to pass through the mails, which it could be shown was not within the description of matter rendered unavailable by the statute. The officer may have acted in perfect good faith in this particular case, he may have had reasonable ground to believe, under all the circumstances brought to his attention, that the letter detained was within the prohibition of the statute; and yet I cannot say, in the present state of the law, that such a plea would be a good defence, either to a public prosecution or to a private suit by the person aggrieved.

In a later case, the Attorney-General, in a communication addressed to the Postmaster-General, under date April 30, 1878, has held that the postmaster at New Orleans was not authorized to withhold from the mails "letters suspected to contain advertisements of lotteries." After referring to other provisions of the law touching the seizure and disposition of matter sent through the mail in violation of law, the Attorney-General concludes "that none of these authorize what can properly be called a seizure of any suspected letters by a postmaster, because probably he is not deemed the proper functionary to bring to trial and punishment those violating the postal laws."

The authorities that I have recited, however, relate to the duty of the postmaster in cases where he *suspects* the law is being violated. It may therefore be regarded as settled by those authorities that under no law is a postmaster authorized to seize suspected letters, with a view to bring to punishment parties charged with violating the postal laws. But suppose a letter known to the postmaster to concern a lottery is offered for mailing, or (as in the case under consideration) for registration, what then becomes the duty of the postmaster? It seems to me there can be but one answer to this question. The law declares in most positive terms that such letters shall neither be conveyed by mail nor deposited in a post-office for that purpose.

It will not be seriously insisted that depositing in a post-office matter declared by law under a heavy penalty to be unmailable fixes upon

the postmaster the duty of treating it as mailable. But this conclusion does not dispose of the difficulty. Is the fact that a letter is addressed to a lottery company to be accepted by him as sufficient evidence that it is a "letter concerning a lottery" to warrant his refusal to register it?

After a very careful consideration of the question, I am of the opinion that such evidence is sufficient for that purpose, and that postmasters ought to be instructed not to register letters addressed to lottery companies. This conclusion is supported by the following considerations:

In the first place, it is well settled that Congress has the power to declare what may and what may not be carried in the mails; in the exercise of that power they have declared that letters concerning lotteries shall not be carried.

In the second place, it has by a long line of decisions, both by the courts and the law department of the government, been held that such construction ought to be given to acts of Congress as will carry out the intention of the law-making power, rather than such construction as will render it inoperative. (8 Johns., 44; 13 N. Y., 81; 5 Barb., 13; 31 N. Y., 289; 3 Dall., 365; 1 Peters, 46; 2 Peters, 672.)

I am aware that this rule relates more particularly to the construction to be given to a statute than to the nature and character of the evidence which is to be admitted as proof of its violation; and admitting the correctness of the construction placed upon a statute, it by no means follows that any given fact is to be taken as proof of its violation. But it has been held that "it is the duty of the courts to so construe statutes as to meet the mischief and to advance the remedy, and not to violate fundamental principles." (8 Johns., 44.) And, again, "Statutes must be interpreted according to their intent and meaning, and not always according to the letter." Again, "Every legislative act must have reasonable construction." (1 Saw., 46.) "That which is implied in a statute is as much a part of it as that which is expressed." (1 Black, 61; 1 Wall., 221.)

What, then, was the intention of Congress in prohibiting the transmission through the mails of letters concerning lotteries? How is the law to be executed or enforced? Postmasters are not authorized to open letters to ascertain whether their contents render them unmailable, neither can they compel the writer to disclose their contents. It follows, therefore, that either the fact that the letter is addressed to the lottery company must be taken as furnishing the only evidence required, and thereby of itself *rendering the letter unmailable*, or else the statute must remain on the books a dead letter. Is the construction that I have given the statute an unreasonable one? I think not. The writer of the letter knows that letters concerning lotteries are unmailable; when, therefore, he addresses a letter to a lottery company, he must know that he raises a strong, if not conclusive, presumption that the letter is unmailable. It is not a sufficient answer to say that a letter not at all concerning a lottery may be addressed to a lottery company. Such is not the reasonable course of human affairs. Letters are frequently addressed to individuals that do not immediately concern the business of the individual addressed. But the case is so far different with a corporation that the law requires a letter addressed to a particular officer of a corporation (giving his name) to be delivered to a different person upon satisfactory evidence that the latter person sustains to the corporation or company the relation indicated in the address; and this under the presumption that a letter addressed to a corporation concerns the business of that corporation.

The law, therefore, presumes that a letter addressed to a lottery com-

pany concerns a lottery. The direction of such a letter, therefore, makes it unmailable, unless the presumption thus raised is removed, and the power to remove this presumption is so easily within the reach of the writer that he has no ground of complaint.

It is difficult to imagine a case in which any one would desire to address a letter to a lottery company on any other than lottery business; but I apprehend that if such a case should arise, the writer himself, in view of the law, would be willing and anxious to show (as he would have no difficulty in showing) that the letter did not "concern" a lottery.

Very respectfully,

A. A. FREEMAN,

Assistant Attorney-General for the Post Office Department.

HON. J. N. TYNER,

First Assistant Postmaster-General.

22 P M G

ARGUMENT
OF
HON. A. A. FREEMAN,
ASSISTANT ATTORNEY-GENERAL FOR THE POST OFFICE DEPARTMENT.
IN RE COMMONWEALTH DISTRIBUTION COMPANY
vs.
POSTMASTER LOUISVILLE, KENTUCKY.

MAY IT PLEASE THE COURT: This is an application for a mandatory injunction to restrain the postmaster at Louisville from obeying the order of the Postmaster-General, directing her to refuse to deliver letters addressed to the Commonwealth Distribution Company, and to return the same to the Dead-Letter Office. It involves the question as to whether the direction of the Postmaster-General has the sanction of the law, for it is admitted that the action of the postmaster in withholding such letters cannot be justified unless the instruction of the Postmaster-General is supported by authority of law.

It is the law rather than the instruction of the Postmaster-General that must justify her action. Within the last half century much has been said in this country and in England on the subject of the rights, powers, and duty of the government in the transmission of mail matter. As late as the 8th of April, 1845, Sir James Graham declared in the House of Commons that the power to open and examine letters had been intrusted to the Executive Government from the earliest period, bearing date even prior to the Revolution. That it was too much to expect that the postal authority of the government, conducted by responsible servants of the Crown, should be made the medium of communication in the promotion of violent and treasonable designs against the safety of the state, and against peace and good order. (Hansard's Parliamentary Debates, vol. 79, p. 318.)

This doctrine was stoutly resisted at that time, and happily has never obtained in this country.

The policy of our legislature has ever been to exclude improper matter altogether, and to preserve sacredly the inviolability of matter permitted to be sent. Once admitted that matter is unmailable, the duty of exclusion follows. On the other hand, when it is admitted that the matter is mailable, it becomes the duty of the government to forward it with due celerity and certainty, and to deliver it promptly. It is only when a question like the one now presented arises as to which of the two classes the matter belongs that any embarrassment can arise.

If the letters in controversy are mailable matter, then the petitioner is entitled to have them delivered to him; if not, he has no such interest

in them as will entitle him to sustain the action. It becomes necessary, therefore, to ascertain what the law is concerning this subject.

The first provision of law in relation to lotteries is found in section 13 of the act approved July 27, 1868, and is as follows:

That it shall not be lawful to deposit in a post-office to be sent by mail any letters or circulars concerning lotteries, so-called gift-concerts, or other similar enterprises, offering prizes of any kind under any pretext whatever.

This was followed by the act of June 8, 1872, section 149 of which provided—

That it shall not be lawful to convey by mail, nor to deposit in a post-office to be sent by mail, any letters or circulars concerning illegal lotteries, so-called gift-concerts, or other similar enterprises offering prizes, or concerning schemes devised and intended to deceive and defraud the public for the purpose of obtaining money under false pretenses, and a penalty of not more than five hundred dollars, nor less than one hundred dollars, with costs of prosecution, is hereby imposed upon conviction in any Federal court of the violation of this section.

This latter act was amended by section 2 of the act approved July 12, 1876, by striking out the word "illegal."

It became, therefore, under this act, unlawful to carry in the mail any letter concerning any character of lottery, whether legal or otherwise. The Postmaster-General, in pursuance of what he understood to be the law, instructed postmasters to refuse to receive or deliver letters addressed to lottery companies or their agents as such. This order was based on what he regarded as a fair and legal presumption that letters addressed to lottery companies "concern" a lottery.

I shall endeavor to show by reason and authority that this is the correct construction of the law, and that the order in question is simply in the line of carrying out the intention of Congress.

I desire to cite a case in which a court of very high authority laid down a rule by which the nature of the contents of a sealed letter might be presumed, without any other evidence of its contents than the circumstances under which it was being carried.

The sixteenth section of the act of April 30, 1810, provided that no person except a mail-carrier should receive for carriage over a mail route any letter or packet, excepting only "such letter or letters as may be directed to the owner or owners of such conveyances and relating to the same, or to the person to whom any packet or bundle in such conveyance is intended to be delivered." (2 Statutes, page 596.)

The supreme court of Massachusetts, in construing this statute, in the case of *Dwight vs. Brewster* (1 Pickering, 50), held as follows:

That section prohibits any person otherwise than the Postmaster-General or his deputies, or persons by them employed, from being concerned in setting up or maintaining any foot or horse post, stage, wagon, or other stage-carriage, on any established post-road, or from one post-town to another, on any adjacent or parallel road, for the purpose of carrying any letters or packets, except newspapers, &c., and punishes by penalty the carrying of letters, &c., except such as may be directed to the owner of the conveyance, and relating to the same, or the person to whom the packet or bundle in such conveyance is intended to be delivered. The carrier of the mail is not prohibited from taking packets and bundles any more than passengers. He will have a right, then, under this section to take letters directed to the owners of such packets or bundles. If, therefore, a letter had been proved to have been sent with a parcel of bank notes, no offense would have been committed. The case of *Bennett vs. Clough* is similar to the present one. There a parcel containing bank-notes, stamps, and a letter was sent by a common carrier, and there being no evidence of the contents of the letter, the presumption of law was that it related to the parcel sent. So here, supposing a letter had been sent, unless its contents were proved, it would be presumed to relate to the bundle.

If a letter sent by a common carrier directed to the consignee of a package conveyed at the same time raises a presumption that the contents of the letter relate to the package, with how much stronger reason—

ing may it be said that a letter addressed to a company or corporation raises the presumption that it relates to or concerns the business of that corporation? This presumption is supported by the almost universal experience of mankind. It is not unusual that letters are addressed to private individuals which do not concern their particular calling or avocation.

The subject-matter of communications thus addressed is of such a variety of character as to be subject to no classification, and give no indication in their address of the subject-matter of their contents. In the case of private partnerships the presumption that the letter addressed to such partnership relates to or concerns the business of the partnership, while stronger than the case of private individuals, is nevertheless not so conclusive as in the case of corporations. So strong, however, is the presumption that letters addressed to a person at his place of business relates to the business of the person addressed, that it was provided in case of bankrupts—

By 12 and 13 Vict., c. 106, s. 124. the court of bankruptcy may order that, for a period of three months from the date of any such order, all posted letters directed or addressed to any bankrupt at the place of which he shall be described in the petition for adjudication of bankruptcy shall be redirected, readdressed, sent, or delivered by the postmaster-general or the officers acting under him, to the official or other assignee or other person named in such order; and upon notice by transmission of a duplicate of any such order to the postmaster-general or the officers acting under him, by the official or other assignee or other person named in such order, of the making of such order, it shall be lawful for the postmaster-general or such officers as aforesaid, in England, Scotland, or Ireland, to readdress, redirect, send, or deliver all such posted letters to the official or other assignee or other person named in such order accordingly; and the court may, upon application to be made for that purpose, renew any such order for a like purpose or for any other less period as often as may be necessary. (Fisher's Common Law Digest, page 6855.)

It was accordingly held in *Meirelles vs. Banning* (2 Barnwell & Adolphus, 909) that—

Letters having arrived at a post-office, addressed to a party who had become bankrupt, the assignee, (in that character) demanded them of the postmaster, and he, believing *bona fide* that the assignee was entitled to have them for the purposes of the commission, delivered them up; this having been the practice of the office under similar circumstances for more than thirty years. Held, that the postmaster was not liable under 9 Anne, c. 10, s. 40, for wittingly, willingly, and knowingly detaining letters, and causing them to be detained and opened.

The presumption that letters addressed to a corporation concern the business for which the corporation was chartered is in fact rather an absolute conclusion of law than a mere presumption. Any presumption to the contrary involves the assumption as a matter of law that a corporation is acting *ultra vires*.

The company on whose motion these proceedings are had, and whose letters have been detained, has no authority of law for the transaction of other than lottery business. It has no social relations to be kept up or preserved through the medium of the mails, and its powers being defined and regulated by law, it is not empowered to transact business of a general character.

I have so far treated the question as if lottery companies occupied towards the government the position of ordinary corporations, chartered for the purpose of promoting agriculture, science, the arts, or other matters of general interest to the public. I submit, however, that a broad distinction exists between lottery companies, although authorized by law, and other institutions of the character mentioned.

Leaving out of view altogether the *morale* of the question, it is enough to say that the highest recognition they have ever received at the hands of the courts is that of mere toleration.

The Supreme Court of the United States, in the case of *Brent vs. Davis* (10 Wheaton, page 402), in discussing the right of a lottery company authorized by an act of Congress, observes :

However questionable may be the policy of *tolerating* lotteries, there can be no question respecting the policy of removing, as far as possible, from those who are concerned in them, all temptation to fraud.

It is placed in the same category with the selling of intoxicating liquors, gaming, &c. (Bishop on Criminal Law, vol. 1, page 493.)

By the statute 10 and 11, W. III, c. 17, all lotteries are declared to be public nuisances, and all grants, patents, and licenses for the same to be contrary to law. (2 Blackstone, page 167.)

The act of Congress which declares that no letter or circular "concerning" a lottery shall be carried in the mail, recognizes this fact.

If lottery companies possess the same right to use the mail which is vested in private citizens, such an act of Congress would unquestionably render null and void the restriction upon carriage of the excluded matter by private post, for while Congress under the Constitution possesses plenary powers over the subject-matter of the establishment of post-offices and post-roads, yet the exercise of the power of exclusion must be confined to matter deemed injurious to the public morals, or in some manner detrimental to the common interests, otherwise the excluded matter may be carried by private post, for the power to prohibit the carriage of any special class of legitimate correspondence by private post rests upon the existing fact that mail facilities for that special class of correspondence is provided by the public post, and on the failure of such facilities, the government abandoning the monopoly as to that class, the reason of the restricting and the restriction itself fall together.

That the lottery business has a "demoralizing influence upon the people" is a fact that has been repeatedly recognized, both by the courts and by Congress.

The policy of the law is to widen and extend the range of mail facilities to the citizen for the transaction of legitimate business, and to deny it altogether for the purposes of promoting the business of lottery companies. There is every presumption of law in favor of the former; the sanctity of his right to use the mail is regarded as inviolate and perfect. Yet even this right does not permit the private citizen under cover of the seal to use the mail for prohibited purposes. In the language of the Supreme Court of the United States in *Ex parte Jackson* (6 Otto, 627)—

Whilst regulations excluding matter from the mail cannot be enforced in a way which would require or permit an examination into letters or sealed packages subject to letter postage, without warrant, issued upon oath or affirmation, in the search for prohibited matter, *they may be enforced* upon competent evidence of their violation obtained in other ways; as from the parties receiving the letters or packages, or from agents depositing them in the post-office, or others cognizant of the facts.

If this right of the citizen is subject to this restriction as declared by the Supreme Court, how much less is the right of a corporation, whose chartered existence is a living invasion of the social law; whose only *chartered use* of the postal service is to violate its express law, which declares that nothing "concerning" it shall be carried in the mails. No circulars and no letters, sealed or unsealed, that "*concern*" a lottery shall be sent in the mails.

But it is insisted for the company that, notwithstanding the act of Congress prohibiting the transmission of letters "concerning" lotteries, lottery companies are nevertheless entitled to the use of the mail for the transmission of all matter declared by law to be *ailable*; that while neither the company nor individuals have a right to send let

ters or circulars "concerning" a lottery, such company and its correspondents have, in common with all other citizens, the right to use the mails for the transmission of mailable matter; that if a letter addressed by a private individual to a lottery company "concerning" a lottery is unmailable, the same is equally true of such a letter addressed by one private individual to another; that the authority of a postmaster to detain a letter is the same in either case, and that if he is not authorized to detain letters in the one case on account of any suspicion he may have of its contents, he is equally unauthorized in the other.

In short, that while he may refuse to transmit or deliver letters "concerning" a lottery, yet he must do so at his peril. That if in the attempt to discharge this duty he should unwittingly detain a letter not subject to detention, he is guilty of a violation of section 3891 of the Revised Statutes, which prescribes a *heavy penalty* for unlawfully detaining, delaying, or opening letters.

If this be a correct construction of the law, and a fair interpretation of the right and duties of postmasters acting thereunder, it becomes at once evident that the statute is a dead letter, and cannot be enforced. It is something more; it is a snare to entrap the honest but unwary public official.

That a postmaster may, under some circumstances, lawfully detain a letter seems clearly implied by the wording of section 3890 Revised Statutes, which provides "that any postmaster who shall *unlawfully* detain in his office any letter or other mail matter, &c., *the posting of which is not prohibited by law, with intent,*" &c.

It is not, therefore, every detention of *strictly mailable* matter that is unlawful.

Section 3937 Revised Statutes provides that—

All domestic letters deposited in any post-office for mailing, on which postage is wholly unpaid, or paid at less than one full rate as required by law, except letters lawfully free, and duly certified letters of soldiers and sailors and marines in the service of the United States, shall be sent by the postmaster to the Dead-Letter Office at Washington.

Again, section 3895 provides that—

All letters, packets, or other matter which may be seized or detained for violation of law shall be returned to the owner or sender, or otherwise disposed of as the Postmaster-General may direct.

It is, therefore, the *unlawful* detention of *mailable* matter that constitutes the offense. Let us admit, then, for the sake of the argument that lottery companies have the same right to use the mails as that possessed by other corporations, or by individuals, for the transmission of mailable matter. What then becomes its duty, and what the duty of the postal officials under the law? We think it will hardly be questioned that, under a statute which makes a letter "concerning" a lottery absolutely unmailable, a letter addressed to a lottery company is at least presumably unmailable.

The law excludes from the mails all liquids, poisons, glass, explosive material, obscene books, lottery letters and circulars, and all articles which from their form or nature are liable to destroy, deface, or otherwise injure the contents of the mail-bag, or the person of any one engaged in the postal service. Here is a very large class of unmailable matter, embracing thousands of articles, many of them useful, some of them absolutely essential to the comfort of mankind. Many of these articles are unmailable on account of their material, others on account of their form, and still others on account of their supposed moral effect. In determining whether any article presented for mailing falls within

the prohibition, or belongs to either one of the classes of prohibited matter, the postmaster is bound to exercise a sound discretion, and it is not to be presumed that the law requires him to exercise that discretion at his peril. It is equally unlawful for him to detain mailable matter, or to forward unmailable matter. How, for instance, is the postmaster to determine whether a book offered for mailing is obscene, or that a certain article is calculated to injure the contents of the mail-bag, or injure the person of any one engaged in the postal service? Explosives are unmailable. Must he test the suspected article? Poisons are excluded. Must he call in the aid of a chemist? Or, must these several articles be excluded by him at the peril of a heavy fine and imprisonment if he should make a mistake?

Such a construction of the law seems absurd. It is submitted that in all cases of this character it is not an unreasonable requirement to expect the sender of the questionable article to remove a doubt which he himself has raised. He, and he alone, can do it, and that, too, without expense or without violating the rights of any one. He ought to consider that the masses of the people, supposed to be represented by the law, have rights to be protected in common with himself.

It is freely admitted that many articles which are declared by law to be unmailable may be sent under the cover of a seal. A poison may be so concealed and sent; but if the usual sign used by druggists to indicate poison were printed on the envelope to warn persons handling it of its dangerous contents, it will hardly be contended that the sanctity of the seal would insure its transmission. The determination of these and similar questions involves the exercise of something more than merely ministerial functions. Certain matter is excluded from the mails on account of its *weight* alone. In the determination of the question of the mailability of articles of this character, nothing is left to the discretion of the officer.

But whether the contents of a letter "concern" a lottery, or are "liable to destroy, deface, or otherwise *injure* the contents of the mail-bag, or the *person of any one engaged in the postal service*," are not ministerial questions, but are judicial in their character, and must be solved in the exercise of a sound discretion, by the aid of such practical appliances as may be in the reach of the officer whose judgment is thus appealed to.

My argument thus far has been based on the assumption that lottery companies are entitled to use the mails for the transaction of other than lottery business. Now, may it please the court, I have the honor to submit, that under a fair interpretation of the postal laws and the laws regulating the powers of corporations, lottery companies are not entitled to use the mails for any purpose, and that the obvious effect of the statute forbidding the transmission of letters and circulars "concerning" a lottery is to interdict the transmission of any letter or circular addressed to a lottery company or its agent as such.

The Commonwealth Distribution Company, although chartered by the State of Kentucky, is not a citizen of the United States.

Mr. Chief Justice Taney, in delivering the opinion of the court in the case of the Ohio and Mississippi Railroad Company *vs.* Wheeler (1 Black, 295), said :

In the case of the Bank of Augusta *vs.* Earle (13 Pet., 512) the court held that the artificial person or legal entity known to the common law as a corporation can have no legal existence out of the bounds of the sovereignty by which it is created; that it exists only in contemplation of law and by force of law; and where that law ceases to operate the corporation can have no existence. It must dwell in the place of its creation.

It had been decided in the case of The Bank *vs.* Deveaux (5 Cr., 61), long before the case of the Bank of Augusta *vs.* Earle came before the court, that a corporation is not

a citizen within the meaning of the Constitution of the United States. * * * The averments in the declaration, said the judge, would seem to imply that the plaintiffs claim to have been created a corporate body, and to have been endowed with the capacities and faculties it possesses by the co-operating legislation of the two States, and to be one and the same legal being in both States. If this were the case it would not affect the question of jurisdiction in this suit. But such a corporation can have no legal existence upon the principles of the common law, or under the decision of this court in the case of the Bank of Augusta *vs.* Earle, before referred to.

Under the Constitution it is perfectly competent for Congress to deny the use of the mails to this or any other corporation. Unlike individuals corporations possess no natural rights, and only such legal rights as the law-making power may see proper to confer upon them. It invokes in this case the authority of law to compel an officer of the United States to deliver its mail matter under a law which declares that letters concerning its business shall not be carried in the mails. Its charter does not authorize it to transact other than lottery business. If the letters it seeks to get possession of do not relate to that business it has no interest in them; if they *do* relate to that business their delivery is unlawful. It must confine itself strictly to the purpose of its organization. Whatever it does "concerns" a lottery. If it sends a letter, it is a letter "concerning" a lottery. If it receives a letter, it is letter "concerning" a lottery. The very addresses on the back of the letters it now seeks to recover "concern" a lottery.

If the letters do not "concern" a lottery, then the lottery company ought not so seriously to concern itself about the letters. If these letters do not relate to its business as a lottery company, then the company is putting itself to an extraordinary amount of labor and expense to accomplish a purpose in which it has no interest.

It must not be forgotten in this connection that we are discussing the rights of the corporation as such. The individual members of it have rights in common with other citizens. They enjoy the same postal facilities; they may send or receive letters on any subject on which they may choose to write. It is the soulless concern known as the Commonwealth Distribution Company of Kentucky whose supposed rights we are discussing, a corporation whose only recognition by the laws of the United States is found in a statute that excludes its letters and its infamous literature from the mails. Its only legitimate business constitutes a species of gambling, the most insidious and, therefore, the most dangerous and demoralizing known to the experience of mankind. Denounced long ago by the laws of England as a nuisance, denied the use of the mails by the law of the land, and its very existence made a criminal offense by the laws of all the States except two or three, it requires a remarkable degree of forensic temerity to claim for it the same right to use the mails as that possessed by an incorporated institution of learning.

It is insisted, however, that the act of Congress must be literally construed. That if Congress had intended to prohibit the transmission of letters "directed" to lottery companies it would have said so. That the interdiction extends only to letters whose contents relate to or "concern" a lottery. A moment's consideration will, I think, demonstrate the incorrectness of this construction of the act. Let us see.

A letter addressed from A to B setting forth the character of the Commonwealth Distribution Company of Kentucky, showing how the investment of a few dollars in the tickets of that institution would realize to the investor a fortune without the labor and waiting incident to the old way of money making, would be a letter "concerning" a lottery; and yet I apprehend that no one will be found to insist that such a letter is within the interdiction of the statute, provided that neither of the

correspondents is in any way concerned as agent or otherwise in promoting the interest of the company. A circular setting forth the author's ideas of the immensely corrupting influence of this worst of all species of modern gambling would be literally a circular "concerning" lotteries, and yet the proposition that such a circular would be unmailable would be treated as simply absurd.

What does the act of Congress mean? What was its enactment designed to accomplish? It meant simply to strike down lottery business by breaking up all postal communications between the companies, their agents, and their victims. In order to effect this purpose it used the very strongest and most comprehensive term it could command.

This, like all other statutes, must be construed with reference, first, to the law as it existed at the date of its enactment, and as it was allowed to remain unaffected by the statute in question, and, second, to the intent of Congress. And in the third place, every act of Congress must receive, if possible, a construction that will render it operative in carrying out the intention of Congress, rather than a construction which renders it void and of no effect. Taking these rules as a guide, we submit, first, that under the law as it existed at the time this statute was passed, no post-office official or other officer of the government was authorized to open a letter with a view to ascertain its contents. It is reasonably fair, then, to conclude that Congress contemplated some other mode of determining whether a letter "concerned" a lottery. Nor is it perceived that there is any other means by which the postmaster whose duty it is claimed is to forward or deliver the letter is enabled to acquaint himself with its contents, except from the address upon the letter. The writer of the letter is unknown. The lottery company declines to disclose the contents of the letter or the name of the writer. As to the second proposition, we have already shown that the object sought to be attained by Congress was the suppression of lottery business so far as that object could be accomplished by denying to companies carrying on that business the right to use the mails.

We are, therefore, driven as a last resort to conclude either that the order of the Postmaster-General directing postmasters to refuse to forward or deliver letters addressed to lottery companies is authorized by law, or that the statute under consideration is a dead letter, a legislative abortion.

Are we driven to the latter alternative by the necessities of this case? Let us see if we are not warranted in assuming for administrative purposes that every letter arriving at this post-office addressed to this company concerns the business of the company, and is therefore unmailable. This company has in every leading newspaper in the United States advertised its business. The only business it proposes to do, the only business it is authorized to do, is a business concerning which the law declares "no letter or circular shall be carried in the mails." It invites the people everywhere to violate this law. It offers a bribe to any one who will disregard the law. It offers a premium for crime and promises the largest premium to the worst criminal. It carefully lays its snare and delusively spreads its fatal net, and then with the song of the siren it allures the thoughtless and tempts the avaricious.

In response to its seductive allurements, thousands of letters come pouring like a flood into the post-office. Now, if the court please, it is not seriously questioned that nine-tenths of these letters concern the lottery, and have been sent in violation of law; for it is idle to say that, of all the world, the postmaster is the only person supposed to be ignorant of the contents of these letters. Gentlemen may ridicule the propo-

sition that the postmaster is authorized to *presume* that these letters relate to the business of the lottery company. It is something more than presumption with him. He knows that the most of them relate to that business, and are, therefore, unmailable. This is a fact known to the postmaster, known to the parties, known to the court, and known to the world. Indeed, the plaintiff in this action does not dare to question it. "But," say the company, "while it is admitted that a portion of this mail, perhaps the larger portion, concerns our lottery, we possibly, and very probably, have other letters that do not concern the lottery, and those you dare not detain." We reply, unhesitatingly: "In the first place, if there are letters here that are simply addressed to you that do not in any manner concern your business, you have no interest in them and, therefore, no right to demand them. If you were a citizen of the United States it would be otherwise; you would then have a right to receive and transmit letters on any subject not prohibited by law, and the law will not presume that your letters relate to prohibited matter; but you are a corporation, and the only business you are authorized to transact is one concerning which the law declares no letters shall be sent in the mails. The necessary presumption or conclusion arising from the address of this letter makes it unmailable."

But, suppose, if the court please, that I am mistaken as to my conclusion that an address on a letter to a lottery company makes it unmailable, and that, on the contrary, such company is entitled to the use of the mails for other purposes, then I say it becomes the duty of the company to separate its mailable from its unmailable matter.

By the law, both of this country and England, the person whose property another has fraudulently mixed with his own, has the right to take possession of the whole mass, for the purpose of separating and securing, or of disposing of the portion belonging to himself, and where the separation and identification cannot be made, the law gives the entire property to him whose goods have been fraudulently mingled. It is for the party guilty of the fraud to distinguish his own goods satisfactorily or lose it. The court will not identify his property for him. (Bigelow on Frauds, pages 97 and 98 and notes.)

Where one person adds mill-logs of his own to a pile of logs belonging to another person, and marks them in the same manner as the others are already marked, he cannot afterwards maintain replevin against such other person for his proportion of the logs, but only for such logs as he can identify to be his own (Dillingham v. Smith, 30 Me., 370); Compare Haseltine v. Stockwell (30 Me., 237); Bryant v. Ware (30 Me., 295); Foster v. Cushing (35 Me., 60); Stephenson v. Little (10 Mich., 433); Wilson v. Wentworth (25 N. H., 5 Fost., 245); Jenkins v. Steanka (19 Wis., 126); Root v. Bonnema (22 W., 539). "The rule is so strict that if the confusion of goods is produced by the wrongful act of one of the owners, he loses his right to the whole, and even his creditors cannot attach his interest or share." (Beach v. Schneally, 20 Ill., 185; Breckenridge v. Holland, 2 Blaskyt, Ind., 377; Leary v. Dearborn, 19 N. H., 351; 39 W., 557; 2 John. Ch., 62; 4 Bos., 155.)

In the case of *The Distilled Spirits*, 11 Wal., 356, the Supreme Court, in pronouncing the opinion, use this language: "It needs no learned examination of the doctrine of confusion or mixture of goods to make it apparent that if certain spirits belonging to the government by forfeiture are voluntarily mixed with other spirits belonging to the same party and passed through the process of rectification in leaches, he cannot thereby deprive the government of its property; and if the government only claim its fair proportion of the rectified spirits, he certainly cannot com-

plain of injustice. The only result of applying the doctrine of confusion of goods would be to forfeit the entire mixture."

Is the right of this company to such of its letters as do not concern a lottery, supposing there are such (although no such allegation is made in the petition), of any higher character than that of the farmer to the wheat which he has fraudulently mingled with his neighbor's? The former, knowing that his wheat is of an unmerchable grade, fraudulently mingles it with a better grade belonging to his neighbor. The law, therefore, tells him he must lose his wheat. The lottery gambler fraudulently procures his mailable and unmailable matter, to be so mingled as to render its separation impracticable. Now why should he be more highly favored than the farmer? "The law will not sanction the fraud of a corporation sooner than that of an individual." (Angell & Ames on corporations, sec. 284, p. 280.)

The proportion that the lottery business has assumed within the last few years, invokes the serious consideration of the court and the country. Take, for example, the State of New York, where the organization of lottery companies or even the sale of lottery tickets is prohibited by statute. There are to-day in the city of New York alone 33 lottery agencies, receiving weekly, on an average, 7,661 ordinary, and 1,993 registered letters. Millions of dollars are flowing annually into their coffers. They are huge financial vampires sucking the life-blood of legitimate business enterprises, inflicting upon society a species of distempered mental leprosy, which will require years to remove. This gigantic work of undermining the best interests of society is being accomplished by a monster that seeks to hide behind the mask of a State charter a visage more hideous than that of the veiled prophet.

Finally, it is insisted for the company that it has a vested interest in letters arriving at this office to its address, and that the action of the department in withholding them amounts to confiscation, and that, too, without due process of law. This argument, however, if good for any purpose, is based upon the assumption that the letters in controversy do not concern the lottery, and are therefore legitimate mail matter. It is only in case of matter entitled by law to be sent through the mails that the party addressed can acquire any interest in it by reason of its having been sent through the mails or deposited for that purpose. The postal authorities are not only not authorized to transmit these letters, but are positively prohibited from so doing, and the deposit in the post-office of these letters is forbidden, and in the absence of any statute on the subject, it would seem, on equitable principles, that the company cannot take advantage of its own wrong, and insist upon setting up a right acquired in violation of law.

The law not only declares that lottery letters shall not be carried in the mails, but denounces a penalty against any person who shall knowingly deposit or send anything to be conveyed by mail in violation of this section. In the transmission of legitimate mail matter, the government is the agent of both parties—the agent of the writer until the matter leaves the office of mailing, and thereafter the agent of the person addressed, except in extraordinary cases, when, for sufficient reasons shown by the writer, the Postmaster-General is authorized to stop the matter *in transitu*. But in the case of unmailable matter the government does not become the agent of either party, except as provided in section 3898 of the Revised Statutes, already referred to, which is as follows:

All letters, packets, or other matter which may be seized or detained for violation of law shall be returned to the owner or sender of the same, or otherwise disposed of, as the Postmaster-General may direct.

Under this statute, the writers of the letters in controversy have never parted with their property in them, so far as the lottery company is concerned, and are entitled by law to have them returned. It is no answer to say that the writers are not insisting on their rights; the law declares that the letters shall be returned or otherwise disposed of, as the Postmaster-General may direct, and does not consult their wishes in the premises. Having violated the law in sending them, they are not entitled to be heard to say what disposition the department may make of them. But whatever may be the equities of the writers, the disposition of these letters does not in any manner affect the rights of the company, for they have acquired no rights by the violation of the law.

If the government, in its efforts to protect the citizens against the immoral tendencies and ruinous results of lottery speculations, should return to him his property, which he had sought to part with in violation of law, it does not rest with the company to complain. In most of the States money lost at gaming may be recovered in an action against the winner. In this particular the complainant's charter may afford it immunity against the liability of the ordinary gambler, yet it is too much to require the government to transmit its stakes or to expect a seal (although, like charity, covering a multitude of sins) to cover the iniquity of its transactions.

RESULTS
OF
AN ACTUAL COUNT OF MAIL MATTER ORIGINATING AT SOME OF THE
PRINCIPAL POST-OFFICES AND ALL RAILWAY POST-OFFICES
DURING THE
FIRST SEVEN DAYS OF NOVEMBER, 1879.

EXPLANATION OF TABLES.

Column 1 gives the number of letters mailed in envelopes not bearing a written or printed return request or business card.

Column 2 gives the number of letters mailed in stamped envelopes with a return request thereon printed by the department.

Column 3 gives the number of letters mailed in envelopes with a written return request or a printed business card, or a post-office box, street and number, or other designation by which the letter is returned direct to the writer when unclaimed.

Column 4 gives the number of letters mailed in official or penalty envelopes or with official postage-stamps affixed.

Column 5 gives the number of postal cards.

Column 6 gives the total number of pieces of first-class matter of all kinds.

Column 7 gives the number of newspapers mailed to regular subscribers, to news-agents, and as sample copies. This and the following item were obtained from the statements of publishers and news agents, who were assured that in no case would the information given by them be disclosed to rival publishers, nor will any detailed statement be made by the department.

Column 8 gives the number of magazines and other second-class publications other than newspapers. This item was obtained in the same manner as the foregoing item number 7.

Column 9 gives the number of pieces of second-class matter of all kinds.

Column 10 gives the number of transient newspapers, circulars, books, and other printed matter.

Column 11 gives the number of packages of all kinds, except as before indicated, including merchandise, &c.

Column 12 gives the total number of pieces of mail matter of all classes.

POST-OFFICE AT NEW YORK, STATE OF NEW YORK.

Statement of mail matter originating at this office for one week, commencing November 1, 1879.

Date: November, 1879.	First-class mail.						Second-class mail.			Third-class mail.	Fourth-class mail.	Total matter mailed of all classes.
	1	2	3	4	5	6	7	8	9			
Saturday, 1st.....	247,177	37,507	178,856	5,557	105,750	574,847	207,181	35,905	242,786	316,182	21,471	1,155,286
Sunday, 2d.....	64,215	7,248	30,817	494	21,879	118,143	106,387	...	106,387	22,877	5,920	253,327
Monday, 3d.....	202,908	40,811	163,094	4,863	106,339	517,795	231,960	30,401	292,361	281,463	17,275	1,058,894
Tuesday, 4th.....	152,414	30,764	144,620	5,868	87,534	421,040	382,005	87,343	419,948	253,968	19,060	1,114,614
Wednesday, 5th.....	153,423	30,505	136,928	5,284	94,489	423,629	765,354	34,962	800,816	211,775	11,485	1,447,705
Thursday, 6th.....	151,812	28,062	136,750	5,716	133,241	456,680	321,040	16,362	340,402	294,871	17,875	1,019,828
Friday, 7th.....	202,032	30,722	148,309	7,253	99,621	498,527	355,999	82,312	388,311	242,426	24,372	1,143,636
Totals.....	1,168,041	206,680	943,033	34,565	648,353	3,000,681	2,374,028	186,965	2,561,011	1,513,530	119,068	7,193,280

THOS. L. JAMES, Postmaster.

POST-OFFICE AT CHICAGO, STATE OF ILLINOIS.

Statement of mail matter originating at this office for one week, commencing November 1, 1879.

Date: November, 1879.	First-class mail.						Second-class mail.			Third-class mail.	Fourth-class mail.	Total matter mailed of all classes.
	1	2	3	4	5	6	7	8	9			
Saturday, 1st.....	11,180	18,721	44,960	18,949	18,473	112,262	71,602	13,003	84,905	88,268	2,090	267,255
Sunday, 2d.....	2,826	2,523	7,260	17	7,517	21,163	13,144	4,800	17,444	5,718	1,177	44,502
Monday, 3d.....	27,049	9,815	44,218	2,467	32,883	110,483	87,653	8,568	46,219	57,283	1,850	231,834
Tuesday, 4th.....	10,653	9,245	14,380	701	16,688	48,687	87,008	9,396	96,384	16,181	1,471	161,997
Wednesday, 5th.....	22,290	14,814	67,677	2,170	38,106	145,047	137,515	22,491	160,006	93,873	8,065	404,490
Thursday, 6th.....	17,417	13,457	54,305	2,645	27,635	117,419	222,725	31,685	254,500	66,805	2,004	401,598
Friday, 7th.....	17,019	13,949	48,605	2,569	30,263	112,404	63,246	24,742	89,988	76,185	2,281	280,858
Totals.....	106,434	79,543	283,405	29,456	171,684	673,474	682,968	116,858	749,246	406,762	12,632	1,842,114

F. W. PALMER, Postmaster.

POST-OFFICE AT BOSTON, STATE OF MASSACHUSETTS.

Statement of mail-matter originating at this office for one week, commencing November 1, 1879.

Date: November, 1879.	First-class mail.						Second-class mail.			Third-class mail.	Fourth-class mail.	Total matter mailed of all classes.
	1	2	3	4	5	6	7	8	9			
Saturday, 1st	36,563	13,704	43,433	2,046	34,408	133,174	95,921	15,713	1,111,634	44,058	2,524	291,390
Sunday, 2d	15,228	1,319	5,105	281	9,163	31,066	6,437	1	6,438	22,146	134	50,804
Monday, 3d	51,747	13,579	44,153	1,745	33,100	144,324	67,008	8,848	71,456	56,751	2,590	275,121
Tuesday, 4th	35,837	10,572	38,259	1,204	30,300	116,672	82,632	8,519	91,151	39,100	2,423	249,346
Wednesday, 5th	32,959	9,886	37,503	1,462	36,884	120,726	123,563	7,294	130,877	47,313	2,556	301,472
Thursday, 6th	34,979	12,670	40,607	1,335	51,236	140,827	106,190	12,601	118,333	47,522	2,570	306,262
Friday, 7th	40,398	17,972	40,048	1,432	51,146	150,967	110,277	12,601	122,878	75,396	3,200	352,451
Totals	250,722	79,714	249,108	9,525	248,737	837,906	592,648	60,119	652,767	332,276	15,967	1,838,836

E. S. TOREY, Postmaster.

POST-OFFICE AT PHILADELPHIA, STATE OF PENNSYLVANIA.

Statement of mail-matter originating at this office for one week, commencing November 1, 1879.

Date: November, 1879.	First-class mail.						Second-class mail.			Third-class mail.	Fourth-class mail.	Total matter mailed of all classes.
	1	2	3	4	5	6	7	8	9			
Saturday, 1st	31,309	9,514	44,468	2,072	28,896	116,549	54,526	21,561	76,087	90,123	2,322	285,081
Sunday, 2d	16,109	381	4,469	48	4,975	25,962	4,399	.....	4,399	6,940	124	37,445
Monday, 3d	45,833	12,631	49,002	1,568	42,706	152,740	41,413	9,428	51,141	62,749	4,478	271,108
Tuesday, 4th	34,683	8,455	44,182	1,290	42,574	131,224	51,557	16,161	70,718	68,902	5,041	272,885
Wednesday, 5th	39,022	11,431	45,113	1,248	24,680	122,794	97,378	24,035	121,413	63,016	4,632	311,255
Thursday, 6th	35,570	8,853	46,743	1,941	53,670	125,790	67,152	30,219	153,371	65,922	4,680	290,733
Friday, 7th	34,949	7,668	61,191	1,547	38,826	144,211	82,009	37,917	119,968	68,261	7,062	340,520
Totals	236,185	59,266	298,068	8,844	216,317	818,680	397,794	139,321	537,115	423,913	28,339	1,806,047

J. F. HARTMANFT, Postmaster.

POST-OFFICE AT CINCINNATI, STATE OF OHIO.

Statement of mail-matter originating at this office for one week, commencing November 1, 1879.

Date: November, 1879.	First-class mail.						Second-class mail.			Third-class mail.	Fourth-class mail.	Total matter mailed of all classes.
	1	2	3	4	5	6	7	8	9			
Saturday, 1st	5,983	3,439	24,121	1,242	13,509	48,354	52,334	6,465	59,299	64,091	675	172,419
Sunday, 2d	1,975	228	2,496	1,150	1,416	6,353	7,465	.....	7,465	1,216	39	14,973
Monday, 3d	11,649	3,124	21,279	1,963	11,898	49,321	69,174	2,864	72,038	39,350	696	161,225
Tuesday, 4th	8,494	3,917	20,884	1,104	13,432	47,351	165,985	2,832	168,827	38,454	489	253,121
Wednesday, 5th	8,407	4,118	20,938	1,499	11,962	47,014	99,203	43,687	139,890	35,498	594	222,904
Thursday, 6th	9,454	4,318	21,444	1,446	16,597	53,291	59,925	9,028	68,953	49,282	737	172,231
Friday, 7th	8,658	4,769	20,562	1,017	13,563	48,589	53,136	12,763	65,899	48,267	443	168,198
Totals	54,680	28,911	131,234	7,891	82,426	390,071	504,782	77,639	582,371	269,096	3,533	1,155,071

JOHN P. LOGE, Postmaster.

POST-OFFICE AT SAINT LOUIS, STATE OF MISSOURI.

Statement of mail-matter originating at this office for one week, commencing November 1, 1879.

Date: November, 1879.	First-class mail.						Second-class mail.			Third-class mail.	Fourth-class mail.	Total matter mailed of all classes.
	1	2	3	4	5	6	7	8	9			
Saturday, 1st	9,706	6,955	31,075	1,242	18,339	67,407	28,201	10,236	38,437	32,128	532	188,504
Sunday, 2d	4,899	1,405	5,410	77	2,212	13,643	14,726	11	14,737	2,301	44	31,025
Monday, 3d	10,710	10,718	28,155	1,379	19,850	76,812	24,323	4,000	28,388	21,002	519	127,316
Tuesday, 4th	14,324	9,783	31,954	1,299	16,940	74,289	76,075	2,733	76,807	33,018	778	196,893
Wednesday, 5th	13,580	11,493	32,207	1,543	18,297	77,099	131,108	2,604	133,712	35,646	881	238,538
Thursday, 6th	13,632	8,286	28,639	1,114	18,256	69,847	55,497	3,643	59,299	31,262	603	161,011
Friday, 7th	13,988	9,764	30,864	1,127	16,920	72,713	27,528	9,732	87,305	29,868	1,274	141,165
Totals	86,629	56,423	188,234	7,811	110,804	452,110	357,413	32,267	390,680	177,020	4,431	1,024,441

NATHANIEL HAYDEN, Postmaster.

POST-OFFICE AT BALTIMORE, STATE OF MARYLAND.

Statement of mail-matter originating at this office for one week, commencing November 1, 1879.

Date: November, 1879.	First-class mail.						Second-class mail.			Third-class mail.	Fourth-class mail.	Total matter mailed of all classes.
	1	2	3	4	5	6	7	8	9	10	11	12
Saturday, 1st	8,886	4,864	15,289	389	11,594	44,972	15,836	551	14,887	15,748	623	73,730
Sunday, 2d	4,077	2,287	1,552	92	1,556	7,564	2,384	.....	2,384	1,407	38	11,393
Monday, 3d	15,024	6,563	13,790	467	11,156	47,000	10,925	568	11,523	33,556	653	92,732
Tuesday, 4th	8,148	7,146	12,944	568	8,438	37,264	21,961	1,279	22,940	4,105	390	64,699
Wednesday, 5th	11,604	6,577	13,636	476	10,420	43,013	15,489	1,169	16,658	4,532	494	64,697
Thursday, 6th	11,323	7,084	13,957	467	11,874	44,655	12,491	3,795	16,286	12,740	456	74,129
Friday, 7th	12,785	7,324	18,579	432	11,041	45,471	16,392	3,369	17,171	11,397	722	74,761
Totals	71,807	39,795	85,347	2,911	66,079	265,939	95,538	7,761	103,349	83,485	3,378	456,151
	E. B. TYLER, Postmaster.											

E. B. TYLER, Postmaster.

POST-OFFICE AT WASHINGTON, DISTRICT OF COLUMBIA.

Statement of mail-matter originating at this office for one week, commencing November 1, 1879.

Date: November, 1879.												
First-class mail.												Total matter mailed of all classes.
Second-class mail.			Third-class mail.			Fourth-class mail.			Total matter mailed of all classes.			
1	2	3	4	5	6	7	8	9	10	11	12	
Saturday, 1st	7,747	4,078	269	29,563	2,509	44,175	8,326	8,326	5,696	143	58,330	
Sunday, 2d	6,106	2,271	309	29,244	2,137	11,067	1,673	1,673	3,545	37	16,325	
Monday, 3d	11,835	4,948	324	32,811	4,645	54,063	22,579	22,579	8,424	147	85,213	
Tuesday, 4th	12,054	6,159	493	39,654	5,834	63,594	16,763	16,763	7,468	234	88,059	
Wednesday, 5th	7,070	4,088	408	1,031	4,049	16,646	6,292	6,292	4,878	290	28,115	
Thursday, 6th	12,038	6,783	586	27,019	5,080	51,565	13,848	13,848	6,812	179	72,344	
Friday, 7th	13,401	6,159	773	36,491	7,565	64,390	7,656	7,656	8,532	194	80,772	
Totals	70,251	34,495	3,161	165,713	31,819	365,440	77,137	77,137	45,348	1,233	429,158	

* J. M. EDMUNDS, Postmaster.

J. M. EDMUNDS, Postmaster.

POST-OFFICE AT SAVANNAH, STATE OF GEORGIA.

Statement of mail-matter originating at this office for one week, commencing November 1, 1879.

	First-class mail.					Second-class mail.				Third-class mail.	Fourth-class mail.	Total matter mailed of all classes.
	1	2	3	4	5	6	7	8	9			
Saturday, 1st.....	2,583	1,045	1,607	199	3,998	9,100	2,650	773	3,423	1,830	128	14,479
Sunday, 2d.....	2,908	1,685	2,710	145	3,965	2,783	300	.....	3,300	280	18	3,881
Monday, 3d.....	2,752	1,264	2,181	154	1,740	8,081	2,660	774	3,424	1,921	185	13,561
Tuesday, 4th.....	2,861	1,128	2,423	112	2,180	8,204	2,650	2,233	4,883	1,774	116	14,977
Wednesday, 5th.....	2,264	1,547	2,390	166	2,565	8,862	2,650	2,233	4,883	1,831	188	15,732
Thursday, 6th.....	2,456	1,448	2,624	149	2,820	9,497	7,600	.....	7,600	1,650	139	18,846
Friday, 7th.....	2,679	1,618	2,841	209	3,210	10,557	2,600	650	3,250	1,584	156	15,547
Totals.....	16,003	8,645	14,676	1,134	16,546	57,004	21,100	6,963	27,763	10,840	926	96,533

L. McLAWS, Postmaster.

POST-OFFICE AT PITTSBURGH, STATE OF PENNSYLVANIA.

Statement of mail-matter originating at this office for one week, commencing November 1, 1879.

	First-class mail						Second-class mail.			Third-class mail.	Fourth-class mail.	Total matter mailed of all classes.
	1	2	3	4	5	6	7	8	9			
Saturday, 1st.....	6,995	5,768	9,524	224	8,786	31,287	3,109	.....	3,109	23,274	497	58,177
Sunday, 2d.....	1,300	255	904	9	1,411	3,879	3,700	.....	3,700	1,108	6	5,708
Monday, 3d.....	8,035	4,370	9,240	360	8,324	30,419	3,648	40	3,688	15,864	270	50,271
Tuesday, 4th.....	6,345	3,852	8,785	323	7,639	27,144	15,581	320	16,901	18,769	243	58,997
Wednesday, 5th.....	6,438	3,763	8,231	324	8,278	27,064	41,233	.....	41,233	16,178	326	84,765
Thursday, 6th.....	7,742	5,862	10,636	249	10,126	34,645	31,898	.....	31,898	14,125	262	80,830
Friday, 7th.....	6,271	4,199	9,638	397	8,644	28,810	16,742	.....	19,742	14,781	803	53,636
Totals.....	43,126	28,109	56,840	1,846	53,318	185,148	115,911	390	116,271	101,064	1,906	402,401

GEO. H. ANDERSON, Postmaster.

POST-OFFICE AT AUGUSTA, STATE OF GEORGIA.
Statement of mail matter originating at this office for one week, commencing November 1, 1879.

Date: November, 1879.	First-class mail.					Second-class mail.			Third-class mail.	Fourth-class mail.	Total matter mailed of all classes.	
	1	2	3	4	5	6	7	8	9	10		11	12
Saturday, 1st.....	665	311	1,089	50	1,085	3,200	2,080	.....	2,080	531	46	5,857
Sunday, 2d.....	184	129	303	22	132	2,770	1,830	.....	1,830	290	7	2,897
Monday, 3d.....	831	252	1,008	65	690	2,905	4,000	.....	4,000	1,511	68	8,484
Tuesday, 4th.....	982	378	1,279	60	944	2,643	2,074	.....	2,074	210	91	6,018
Wednesday, 5th.....	694	423	1,064	22	741	2,974	1,815	.....	1,815	515	28	5,333
Thursday, 6th.....	838	368	1,010	62	673	2,951	2,195	.....	2,195	553	55	5,754
Friday, 7th.....	990	379	1,115	75	831	3,360	1,833	.....	1,833	642	67	5,903
Totals.....	5,204	2,250	6,868	356	5,105	19,893	15,827	.....	15,827	4,152	392	40,124

CHARLES H. PRINCE, Postmaster.

POST-OFFICE AT ATLANTA, STATE OF GEORGIA.
Statement of mail matter originating at this office for one week, commencing November 1, 1879.

Date: November, 1879.	First-class mail.					Second-class mail.			Third-class mail.	Fourth-class mail.	Total matter mailed of all classes.	
	1	2	3	4	5	6	7	8	9	10	11	12
Saturday, 1st	1,222	547	1,858	640	2,570	6,837	10,201	.....	10,201	4,261	87	21,486
Sunday, 2d	613	207	597	87	687	2,191	9,411	.....	9,411	1,307	11	11,920
Monday, 3d	2,302	525	1,890	550	1,687	6,954	12,001	.....	12,001	1,364	71	20,450
Tuesday, 4th	2,054	681	2,512	1,110	1,140	7,497	16,296	1,590	17,856	43,974	130	69,457
Wednesday, 5th	2,182	534	1,723	686	2,410	7,535	2,523	.....	2,523	1,568	79	11,735
Thursday, 6th	2,087	639	2,298	868	2,283	8,185	8,861	.....	8,861	1,630	122	18,808
Friday, 7th	2,151	752	1,996	959	2,220	8,078	9,411	.....	9,411	1,858	147	19,494
Totals	12,611	3,885	12,974	4,920	12,997	47,387	68,734	1,590	70,324	54,992	647	173,350

BENJAMIN CONLEY, Postmaster.

POST-OFFICE AT BANGOR, STATE OF MAINE.

Statement of mail matter originating at this office for one week, commencing November 1, 1879.

Date: November, 1879.	First-class mail					Second-class mail			Third-class mail.	Fourth-class mail.	Total matter mailed of all classes.
	1	2	3	4	5	6	7	8			
Saturday, 1st	721	307	442	146	619	2, 235	769		448	11	13
Sunday, 2d											
Monday, 3d	2, 123	326	628	173	942	4, 192	749	769	591	39	3, 499
Tuesday, 4th	976	436	432	130	560	2, 563	756	30	389	42	5, 571
Wednesday, 5th	965	411	582	173	649	2, 780	2, 285		279	48	5, 392
Thursday, 6th	1, 042	422	404	205	590	2, 663	3, 238		413	67	6, 381
Friday, 7th	960	292	403	190	590	2, 453	749		407	40	3, 049
Totals	6, 796	2, 194	2, 891	1, 017	3, 963	16, 886	8, 546	30	2, 537	263	28, 282

AUGUSTUS B. FARNHAM, Postmaster.

POST-OFFICE AT DAVENPORT, STATE OF IOWA.

Statement of mail matter originating at this office for one week, commencing November 1, 1879.

Date: November, 1879.	First-class mail					Second-class mail			Third-class mail.	Fourth-class mail.	Total matter mailed of all classes.
	1	2	3	4	5	6	7	8			
Saturday, 1st	513	248	964	102	755	2, 532	1, 967		905	11	13
Sunday, 2d											
Monday, 3d	1, 295	190	925	188	1, 308	3, 908	1, 153	2	1, 484	38	5, 530
Tuesday, 4th	660	197	1, 319	179	652	3, 016	1, 266	9	1, 142	34	6, 590
Wednesday, 5th	1, 056	163	855	171	769	3, 014	5, 374	2	904	13	9, 811
Thursday, 6th	832	314	1, 293	164	748	3, 351	6, 242	17	616	26	9, 252
Friday, 7th	551	344	888	173	423	2, 478	1, 227	4	1, 397	36	5, 144
Totals	4, 916	1, 456	6, 344	976	4, 055	18, 349	16, 304	64	6, 448	175	41, 224

EDWARD RUSSELL, Postmaster.

POST-OFFICE AT DETROIT, STATE OF MICHIGAN.

Statement of mail matter originating at this office for one week, commencing November 1, 1879.

Date : November, 1879.	First-class mail.						Second-class mail.			Third-class mail.	Fourth-class mail.	Total matter mailed of all classes.
	1	2	3	4	5	6	7	8	9			
Saturday, 1st.....	3,828	5,371	4,022	471	4,259	18,551	9,994	62	10,056	18,069	519	47,196
Sunday, 2d.....	1,160	535	1,133	24	1,642	4,494	130	.....	.....	1,700	8	6,332
Monday, 3d.....	9,176	6,876	6,515	602	6,146	29,315	21,374	150	21,524	12,656	378	63,873
Tuesday, 4th.....	6,398	4,779	4,823	535	5,465	21,000	38,933	16	39,949	6,157	384	67,490
Wednesday, 5th.....	3,980	5,076	4,063	459	3,544	17,132	49,356	4	49,360	5,325	429	72,246
Thursday, 6th.....	5,760	6,196	6,506	1,576	4,751	24,854	24,416	1	24,417	7,555	409	57,235
Friday, 7th.....	4,374	6,575	5,498	3,478	5,933	25,846	19,185	176	19,361	5,190	625	51,022
Totals.....	33,691	35,408	33,208	7,145	31,740	141,192	164,398	409	164,797	56,632	2,752	395,398

GEORGE C. CODD, Postmaster.

POST-OFFICE AT KEOKUK, STATE OF IOWA.

Statement of mail matter originating at this office for one week, commencing November 1, 1879.

Date : November, 1879.	First-class mail.						Second-class mail.			Third-class mail.	Fourth-class mail.	Total matter mailed of all classes.
	1	2	3	4	5	6	7	8	9			
Saturday, 1st.....	267	281	279	50	240	1,107	1,992	.....	1,992	67	8	3,084
Sunday, 2d.....	319	107	427	6	274	1,133	1,210	.....	1,210	336	12	2,691
Monday, 3d.....	793	332	705	58	642	2,588	1,411	.....	1,412	244	10	2,267
Tuesday, 4th.....	1,594	383	653	62	592	2,411	1,453	1	1,453	487	14	4,569
Wednesday, 5th.....	559	331	831	56	906	2,365	1,771	.....	1,774	163	12	4,594
Thursday, 6th.....	548	331	1,390	45	443	2,759	4,827	3	4,830	191	14	7,892
Friday, 7th.....	448	363	435	64	570	1,900	2,817	2	2,819	321	17	5,057
Totals.....	3,418	2,128	4,830	339	3,771	14,486	14,436	12	14,448	1,796	96	30,823

SAMUEL M. CLARK, Postmaster.

POST-OFFICE AT INDIANAPOLIS, STATE OF INDIANA.

Statement of mail matter originating at this office for one week, commencing November 1, 1879.

Date: November, 1879.	First-class mail.						Second-class mail.			Third-class mail.	Fourth-class mail.	Total matter mailed of all classes.
	1	2	3	4	5	6	7	8	9			
Saturday 1st.....	3,022	1,236	3,194	305	2,557	9,324	1,135	.....	1,135	3,751	53	14,323
Sunday 2d.....	1,467	1,139	1,014	21	363	3,004	.....	.....	.....	3,176	4	3,184
Monday 3d.....	4,873	1,553	4,094	249	5,577	16,375	1,137	.....	1,137	3,874	83	21,269
Tuesday 4th.....	2,793	1,395	3,656	173	2,458	10,511	14,949	2,678	17,627	3,381	43	31,562
Wednesday 5th.....	3,982	2,512	4,704	449	4,590	16,227	19,704	969	20,573	3,393	33	40,226
Thursday 6th.....	3,345	2,328	4,489	301	4,186	14,643	8,329	7,086	15,415	2,543	25	33,638
Friday 7th.....	4,422	2,852	4,183	625	5,856	17,918	4,642	.....	4,642	5,320	50	27,930
Totals.....	22,974	12,045	25,344	2,127	25,571	88,062	49,896	10,633	60,529	23,238	291	172,120

WILLIAM B. HOLLOWAY, Postmaster.

POST-OFFICE AT MONTGOMERY, STATE OF ALABAMA.

Statement of mail matter originating at this office for one week, commencing November 1, 1879.

Date: November, 1879.	First-class mail.						Second-class mail.			Third-class mail.	Fourth-class mail.	Total matter mailed of all classes.
	1	2	3	4	5	6	7	8	9			
Saturday 1st.....	759	684	980	80	827	3,330	970	.....	970	181	47	4,478
Sunday 2d.....	265	98	453	4	127	947	970	.....	970	28	4	1,947
Monday 3d.....	615	505	89	244	956	2,408	1,600	.....	1,600	115	14	4,137
Tuesday 4th.....	652	448	910	22	642	2,674	970	.....	970	111	20	3,775
Wednesday 5th.....	623	538	998	121	906	3,188	970	.....	970	146	65	4,399
Thursday 6th.....	811	344	843	80	843	2,463	970	.....	970	166	36	3,561
Friday 7th.....	1,064	868	1,397	99	1,084	4,452	1,070	.....	1,070	288	33	5,973
Totals.....	4,354	3,505	5,638	659	5,384	19,490	7,530	.....	7,530	1,015	219	28,244

ISRAEL W. HOBERTS, Postmaster.

POST-OFFICE AT NASHVILLE, STATE OF TENNESSEE.
Statement of mail matter originating at this office for one week, commencing November 1, 1879.

Date: November, 1879.												

WILLIAM P. JONES, Postmaster.

POST-OFFICE AT RICHMOND, STATE OF VIRGINIA.
Statement of mail matter originating at this office for one week, commencing November 1, 1879.

Date: November, 1879.	First-class mail.						Second-class mail.			Third-class mail.	Fourth-class mail.	Total matter mailed of all classes.
	1	2	3	4	5	6	7	8	9	10	11	12
Saturday, 1st.....	3,257	1,174	2,278	274	4,724	11,707	6,790	453	7,243	1,015	109	27,317
Sunday, 2d.....	3,657	511	2,559	3	3,900	2,880	3,467	232	3,699	1,419	6	10,653
Monday, 3d.....	3,823	1,120	2,942	192	3,242	10,619	1,500	76	1,576	1,616	127	15,524
Tuesday, 4th.....	2,752	1,681	1,889	216	4,182	11,070	14,554	517	15,071	1,424	171	43,407
Wednesday, 5th.....	2,187	1,902	1,977	179	2,807	6,052	16,123	60	16,183	2,093	189	42,590
Thursday, 6th.....	3,223	1,614	2,073	173	4,407	12,595	12,062	587	12,589	1,467	167	33,317
Friday, 7th.....	2,009	863	1,676	222	3,054	8,404	5,000	54	5,054	2,355	124	22,191
Totals.....	19,318	7,865	14,349	1,259	22,496	65,787	60,036	1,979	62,015	10,299	833	200,998

W. W. FORBES, Postmaster.

POST-OFFICE AT PROVIDENCE, STATE OF RHODE ISLAND.

Statement of mail matter originating at this office for one week, commencing November 1, 1879.

Date: November, 1879.	First-class mail.						Second-class mail.			Third-class mail.	Fourth-class mail.	Total matter mailed of all classes.
	1	2	3	4	5	6	7	8	9			
Saturday, 1st	3,574	2,232	4,385	164	2,776	13,151	2,971	283	8,204	5,821	333	22,509
Sunday, 2d	1,976	2,205	4,454	19	800	3,454	2,655	.....	2,261	281	2	4,373
Monday, 3d	6,562	2,568	4,117	109	3,290	16,671	2,622	82	2,704	7,672	153	27,199
Tuesday, 4th	5,249	2,243	3,461	131	3,215	14,289	2,162	15	2,177	4,683	158	21,297
Wednesday, 5th	4,494	2,077	3,227	160	2,909	12,867	2,162	32	2,194	4,415	164	19,644
Thursday, 6th	4,747	2,000	3,296	172	3,135	13,280	2,622	13	2,635	2,987	165	20,067
Friday, 7th	4,941	2,010	3,204	113	3,058	13,326	8,870	4,097	12,967	4,546	160	20,969
Totals	31,543	13,380	22,074	868	19,183	87,048	22,064	4,472	26,536	31,365	1,138	146,087

CHARLES R. BRAYTON, Postmaster.

Statement of matter mailed on the routes, First Division Railway Mail Service, comprising the New England States, for one week, commencing November 1, 1879.

Date: November, 1879.	First-class mail.						Second-class mail.			Third-class mail.	Fourth-class mail.	Total matter mailed of all classes.
	1	2	3	4	5	6	7	8	9			
Saturday, 1st	4,223	1,909	2,509	142	2,921	19,814	187	2	189	977	77	12,037
Sunday, 2d	1,172	129	2,892	2	2,241	1,847	4	.....	4	49	88	2,000
Monday, 3d	8,692	1,892	2,847	189	4,013	17,693	195	.....	195	784	93	18,673
Tuesday, 4th	6,041	2,063	2,766	173	2,840	13,382	216	.....	221	718	90	14,412
Wednesday, 5th	4,951	1,770	2,178	104	2,268	12,845	241	1	242	784	77	13,448
Thursday, 6th	4,412	2,131	2,318	163	3,468	12,305	223	.....	223	847	77	14,361
Friday, 7th	4,089	2,015	2,685	186	3,791	12,778	239	.....	240	809	86	13,913
Totals	34,530	11,587	15,677	1,087	19,197	82,078	1,804	9	1,313	4,968	500	88,889

THOS. F. CHENEY, Superintendent.

Statement of matter mailed on the routes in Second Division Railway Mail Service, comprising New York, New Jersey, Pennsylvania, Delaware, and the Eastern Shore of Maryland, for one week, commencing November 1, 1879.

Date: November, 1879.	First-class mail.						Second-class mail.			Third-class mail.	Fourth-class mail.	Total matter mailed of all classes.
	1	2	3	4	5	6	7	8	9			
Saturday, 1st	5,036	1,718	2,671	219	3,334	12,978	355	2	357	876	38	14,249
Sunday, 2d	1,200	163	601	46	463	2,473	79	.....	79	219	1	2,772
Monday, 3d	7,870	1,866	3,076	163	4,456	17,451	511	.....	466	873	42	18,882
Tuesday, 4th	5,822	1,635	3,102	147	4,173	14,879	512	.....	519	866	106	16,160
Wednesday, 5th	5,746	1,977	3,067	186	4,047	15,023	540	.....	540	868	54	16,485
Thursday, 6th	5,805	2,023	3,513	197	4,283	15,821	368	.....	474	777	56	17,128
Friday, 7th	6,228	1,968	3,259	247	4,312	16,014	837	.....	941	775	48	17,778
Totals	37,707	11,350	19,289	1,225	25,068	94,639	3,332	44	3,376	5,944	345	108,404

R. C. JACKSON, Superintendent.

Statement of matter mailed on the routes in Third Division Railway Mail Service, comprising Maryland (excluding the Eastern Shore), North Carolina, Virginia, West Virginia, and the District of Columbia, for one week, commencing November 1, 1879.

Date: November, 1879.	First-class mail.						Second-class mail.			Third-class mail.	Fourth-class mail.	Total matter mailed of all classes.
	1	2	3	4	5	6	7	8	9			
Saturday, 1st	1,726	536	766	38	2,017	5,023	31	.....	37	277	22	5,359
Sunday, 2d	1,749	179	282	19	513	1,732	216	1	217	32	4	1,975
Monday, 3d	1,900	699	837	81	1,765	5,472	45	.....	48	103	5	5,628
Tuesday, 4th	1,975	967	1,096	89	1,896	5,632	221	.....	36	106	20	5,764
Wednesday, 5th	1,812	716	1,094	87	1,768	5,318	34	.....	37	166	15	5,536
Thursday, 6th	1,811	616	1,110	53	1,756	5,345	70	.....	73	99	21	5,539
Friday, 7th	2,068	755	1,188	34	1,861	5,857	18	.....	19	217	8	6,101
Totals	12,122	4,168	6,143	350	11,576	34,369	437	20	457	1,000	95	35,921

M. V. BAILEY, Superintendent.

Statement of matter mailed on the routes in Fourth Division Railway Mail Service, comprising South Carolina, Georgia, Florida, Alabama, Mississippi, and Louisiana, for one week, commencing November 1, 1879.

Date: November, 1879.												
	First-class mail.						Second-class mail.			Third-class mail.	Fourth-class mail.	Total matter mailed of all classes.
	1	2	3	4	5	6	7	8	9			
Saturday, 1st	4,569	2,959	3,017	137	3,810	14,432	25	36	61	2,063	42	16,598
Sunday, 2d	2,443	1,771	1,967	103	1,388	5,773	148	148	140	2,271	28	6,290
Monday, 3d	4,714	1,732	2,542	194	3,276	12,458	37	17	54	808	53	13,373
Tuesday, 4th	4,984	2,593	3,732	190	3,753	14,542	13	32	45	908	59	15,554
Wednesday, 5th	3,920	2,373	2,471	176	3,942	12,682	128	7	133	553	43	13,413
Thursday, 6th	4,423	2,405	3,578	137	4,254	14,797	104	28	132	1,103	15	16,047
Friday, 7th	4,287	2,304	3,500	150	3,678	13,919	16	40	56	721	57	14,753
Totals	28,660	14,947	19,907	1,087	24,001	88,602	471	161	632	6,427	297	95,958

L. M. TERRELL, Superintendent.

Statement of matter mailed on the routes in Fifth Division Railway Mail Service, comprising Ohio, Indiana, Kentucky, and Tennessee, for one week, commencing November 1, 1879.

Date: November, 1879.	First-class mail.						Second-class mail.			Third-class mail.	Fourth-class mail.	Total matter mailed of all classes.
	1	2	3	4	5	6	7	8	9			
Saturday, 1st.....	3,865	1,706	2,082	187	3,761	11,551	77	19	96	416	36	12,099
Sunday, 2d.....	1,378	315	722	48	817	3,280	7	0	7	107	3	3,397
Monday, 3d.....	5,750	1,857	2,745	151	5,079	15,562	31	9	40	385	33	16,040
Tuesday, 4th.....	4,407	1,480	2,369	110	3,890	12,256	35	10	45	397	22	12,720
Wednesday, 5th.....	4,217	1,709	2,540	115	4,342	12,923	44	8	52	376	42	13,393
Thursday, 6th.....	4,274	1,694	2,547	85	4,160	12,760	24	20	44	460	24	13,288
Friday, 7th.....	4,082	1,660	2,611	227	4,542	13,132	30	7	37	420	14	13,603
Totals.....	27,973	10,421	15,616	863	26,591	81,484	248	73	321	2,561	174	84,540

C. JAY FRENCH, Superintendent.

Statement of matter mailed on the routes in Sixth Division Railway Mail Service, comprising Wisconsin, Illinois, Iowa, Nebraska, Minnesota, and upper peninsula of Michigan, and the Territories of Dakota and Wyoming, for one week, commencing November 1, 1879.

	First-class mail.						Second-class mail.			Third-class mail.	Fourth-class mail.	Total matter mailed of all classes.
	1	2	3	4	5	6	7	8	9	10	11	12
Saturday, 1st	7,283	2,904	4,397	166	7,451	22,291				1,595	106	23,992
Sunday, 2d	1,188	313	872	35	925	2,733				167	4	2,904
Monday, 3d	12,450	4,117	6,323	185	9,923	32,998				1,966	82	34,676
Tuesday, 4th	8,310	3,260	5,283	160	7,301	24,324				1,315	64	25,703
Wednesday, 5th	8,267	3,371	5,278	157	8,005	25,078				1,312	82	26,472
Thursday, 6th	7,976	3,600	5,505	154	8,525	25,760				1,284	61	27,065
Friday, 7th	8,413	3,447	5,226	148	7,813	25,047				1,227	68	26,342
Totals	53,887	21,102	32,594	1,005	49,643	158,231				8,476	467	167,174

JAMES E. WHITE, Superintendent.

Statement of matter mailed on routes in Seventh Division Railway Mail Service, comprising Missouri, Kansas, Arkansas, Texas, Colorado, the Indian Territory, and New Mexico, for one week, commencing November 1, 1879.

	First-class mail.					Second-class mail.				Third-class mail.	Fourth-class mail.	Total matter mailed of all classes.
	1	2	3	4	5	6	7	8	9				10	11	12
Saturday, 1st	4,162	1,935	2,430	108	3,443	12,078				574	79	12,731
Sunday, 2d	2,408	658	1,279	33	1,733	6,111				418	12	6,541
Monday, 3d	5,252	2,073	3,435	176	4,615	15,551				420	32	16,003
Tuesday, 4th	4,310	1,831	2,989	171	4,570	13,771				452	34	14,257
Wednesday, 5th	4,186	1,911	3,393	137	3,997	13,534				621	28	14,183
Thursday, 6th	4,491	1,782	2,669	128	4,025	13,105				438	32	13,575
Friday, 7th	4,087	1,990	2,975	130	4,855	14,037				357	57	14,451
Totals	28,896	12,190	19,070	883	27,148	88,187				3,280	274	91,741

W. L. HUNT, Superintendent.

Statement of matter mailed on the routes, Eighth Division Railway Mail Service, comprising California, Nevada, Oregon, and the Territories of Alaska, Arizona, Idaho, Montana, Utah, and Washington, for one week commencing November 1, 1879.

Date: November, 1879.	First-class mail.					Second-class mail.			Third-class mail.	Fourth-class mail.	Total matter mailed of all classes.
	1	2	3	4	5	6	7	8	9		
Saturday 1st.....	1,242	319	346	13	341	2,261			145	6	2,413
Sunday 2d.....	1,892	159	323	9	187	1,570			117	4	1,691
Monday 3d.....	1,819	536	420	12	310	3,097			167	5	3,269
Tuesday 4th.....	1,383	444	566	16	276	2,811			187	5	2,998
Wednesday 5th.....	1,443	372	599	20	403	2,837			204	2	3,043
Thursday 6th.....	1,489	418	498	23	340	2,748			175	3	2,926
Friday 7th.....	1,467	349	520	23	349	2,707			139	.....	2,846
Totals.....	9,715	2,599	3,300	111	2,306	18,031			1,074	25	19,130

H. J. McKUSICK, Superintendent.

Statement of matter mailed on the routes, Ninth Division, Railway Mail Service, comprising the through mails via Buffalo, Suspension Bridge, Toledo, and Detroit, the lines of the Lake Shore and Michigan Southern Railroad, and the Lower Peninsula of Michigan, for one week commencing November 1, 1879.

Date: November, 1879.	First-class mail.					Second-class mail.			Third-class mail.	Fourth-class mail.	Total matter mailed of all classes.
	1	2	3	4	5	6	7	8	9		
Saturday 1st.....	2,228	1,568	1,779	86	2,108	7,699	606	2	698	943	8,748
Sunday 2d.....	4,891	1,192	464	23	386	1,969	.....	.....	.....	111	2,100
Monday 3d.....	2,041	1,633	1,623	118	8,193	16,064	591	8	599	331	11,662
Tuesday 4th.....	2,547	1,039	1,136	78	2,375	7,475	253	15	268	362	8,119
Wednesday 5th.....	2,600	1,439	2,117	70	2,244	8,480	231	.....	251	245	9,009
Thursday 6th.....	2,919	1,362	1,609	103	2,472	8,966	254	.....	254	297	9,547
Friday 7th.....	2,566	1,650	1,692	79	2,036	8,023	237	.....	237	260	8,545
Totals.....	17,783	9,298	10,836	507	14,841	53,315	2,292	25	2,317	1,967	57,670

W. G. LOVELL, Superintendent.

RECAPITULATION.

Statement of matter mailed on all railroad and steamboat lines in the United States, for one week commencing November 1, 1879.

Railway mail service.	First-class mail.						Second-class mail.			Third-class mail.	Fourth-class mail.	Total matter mailed of all classes.
	1	2	3	4	5	6	7	8	9	10	11	12
First division	34,530	11,537	15,677	1,037	19,197	82,078	1,304	9	1,313	4,968	500	88,859
Second division	37,707	11,350	19,299	1,225	25,068	94,639	3,332	44	3,376	5,044	345	103,404
Third division	12,132	4,168	6,143	350	11,576	34,309	437	20	437	1,000	95	35,921
Fourth division	28,660	14,947	19,907	1,037	24,001	88,602	471	161	632	6,427	297	95,958
Fifth division	27,973	10,421	15,616	883	26,591	81,484	248	73	821	2,561	174	84,540
Sixth division	53,887	21,102	32,594	1,005	49,643	156,231	.....	.....	.....	8,476	467	167,174
Seventh division	28,896	12,190	19,070	883	27,148	88,187	.....	.....	.....	3,280	274	91,741
Eighth division	9,715	2,599	3,300	111	2,306	18,031	.....	.....	.....	1,074	25	19,130
Ninth division	17,763	9,298	10,836	557	14,841	53,315	2,292	25	2,317	1,967	71	57,670
Totals	251,283	97,662	142,432	7,188	200,371	698,936	8,084	332	8,416	34,797	2,248	744,397

Second-class matter mailed at the six largest post-offices in the United States, during the fiscal year ended June 30, 1879.

Post-office.	Pounds.	Amount of postage.	Percentage of the whole amount collected in the United States.
New York	15,861,662	\$343,827 40	31.1+
Chicago	4,265,096	90,790 60	8.2+
Boston	3,238,374	68,472 30	6.3+
Philadelphia	2,524,976	56,182 92	5.3+
Saint Louis	2,267,227	47,000 47	4.2+
Cincinnati	2,066,349	43,690 08	3.9+
Total	30,223,674	652,972 77	59.1+

ANNUAL REPORT

OF THE

AUDITOR OF THE TREASURY

FOR THE

POST-OFFICE DEPARTMENT

FOR THE

FISCAL YEAR ENDED JUNE 30, 1879.

24 P M G

REPORT

OF THE

AUDITOR OF THE POST-OFFICE DEPARTMENT.

OFFICE OF THE AUDITOR OF THE TREASURY
FOR THE POST-OFFICE DEPARTMENT,
October 30, 1879.

SIR: I have the honor to submit the following annual report of the receipts and expenditures of the Post-Office Department, together with the operations of this office in connection therewith, for the fiscal year ended June 30, 1879.

COLLECTION OF POST-OFFICE REVENUES.

The number of post-offices in operation during the year was 40,947, which are classified, under the regulations adopted for the government of the department, chapter 2, section 76, as follows: Special offices, depositing offices, depository and draft offices, and collection offices.

The following-named offices are denominated depositories or draft offices, and are required by the Postmaster-General to receive and retain, subject to the drafts of the department, the funds of certain adjacent offices as well as the revenues of their own, viz:

Adrian, Mich., J. H. Fee.
Albany, N. Y., W. H. Craig.
Albia, Iowa, V. Mendell.
Atlanta, Ga., Benjamin Conley.
Auburn, N. Y., N. P. Clark.
Augusta, Me., H. H. Hamlin.
Austin, Tex., H. B. Kinney.
Bangor, Me., A. B. Farnham.
Batavia, N. Y., William Tyrrell.
Bay City, Mich., F. W. Dunham.
Binghamton, N. Y., E. B. Stephens.
Burlington, Vt., B. J. Derby.
Charleston, Ill., G. M. Mitchell.
Charleston, S. C., B. A. Roseman.
Cleveland, Ohio, N. B. Sherwin.
Columbus, Ohio, A. D. Rodgers.
Concord, N. H., J. E. Larkin.
Decorah, Iowa, A. K. Bailey.
Denver, Colo., W. N. Byers.
Des Moines, Iowa, J. S. Clarkson.
Detroit, Mich., G. C. Codd.
Dubuque, Iowa, G. L. Torbert.
East Saginaw, Mich., T. Saylor.
Elmira, N. Y., D. F. Pickering.
Evansville, Ind., F. M. Thayer.
Fort Dodge, Iowa, N. M. Page.
Fort Wayne, Ind., F. W. Keil.
Grand Rapids, Mich., J. Gallup.
Harrisburg, Pa., M. W. McAlarney.
Hartford, Conn., J. H. Burnham.
Houghton, Mich., F. A. Douglass.
Houston, Tex., J. Richardson.
Huntsville, Ala., J. D. Sibley.
Indianapolis, Ind., W. R. Holloway.

Iowa City, Iowa, Benjamin Owen.
Jacksonville, Fla., H. Jay.
Jamestown, N. Y., A. M. Clark.
Kalamazoo, Mich., L. B. Kendall.
Keene, N. H., A. Smith.
Keokuk, Iowa, S. M. Clark.
Knoxville, Tenn., William Rule.
Lansing, Mich., S. D. Bingham.
Leavenworth, Kans., D. R. Anthony.
Lexington, Ky., H. K. Milward.
Lima, Ohio, George P. Waldorf.
Louisville, Ky., V. C. Thompson.
Madison, Wis., E. W. Keyes.
Malone, N. Y., J. J. Seaver.
Marquette, Mich., S. M. Billings.
Marshalltown, Iowa, E. Schurtz.
Meadville, Pa., J. F. Morris.
Memphis, Tenn., A. D. H. Thompson.
Milwaukee, Wis., H. C. Payne.
Mobile, Ala., M. D. Wickersham.
Montgomery, Ala., I. W. Roberts.
Montpelier, Vt., J. W. Clark.
Mount Pleasant, Iowa, G. W. McAdam.
Nashville, Tenn., W. P. Jones.
Newark, N. J., W. Ward.
New Bedford, Mass., T. Coggeshall.
New Haven, Conn., N. D. Sperry.
Norwich, N. Y., J. K. Spaulding.
Ogdenburg, N. Y., R. G. Pettibone.
Olean, N. Y., M. B. Fobes.
Omaha, Nebr., T. F. Hall.
Peoria, Ill., J. S. Stevens.
Pittsburgh, Pa., G. H. Anderson.
Plattsburgh, N. Y., H. S. Ransom.

Portland, Me., C. W. Goddard.
 Portsmouth, N. H., E. G. Pierce, jr.
 Portsmouth, Ohio, F. C. Gibbs.
 Providence, R. I., C. R. Brayton.
 Raleigh, N. C., W. W. Holden.
 Richmond, Va., Wm. W. Forbes.
 Rochester, N. Y., D. T. Hunt.
 Rutland, Vt., A. H. Tuttle.
 Saint Albans, Vt., B. D. Hopkins.
 Saint Johnsbury, Vt., C. P. Carpenter,
 (2d).
 Saint Paul, Minn., David Day.
 Sandusky, Ohio, J. M. Boalt.
 Savannah, Ga., L. McLaws.
 Scranton, Pa., J. A. Scranton.
 Springfield, Ill., D. L. Phillips.

Springfield, Mass., H. C. Lee.
 Steubenville, Ohio, F. O'Neal.
 Syracuse, N. Y., A. C. Chace.
 Taunton, Mass., E. E. Fuller.
 Terre Haute, Ind., N. Filbeck.
 Towanda, Pa., P. Powell.
 Urbana, Ohio, W. A. Braud.
 Utica, N. Y., C. H. Hopkins.
 Watertown, N. Y., W. G. Williams.
 Wellsborough, Pa., G. W. Merrick.
 Wheeling, W. Va., Hugh Sterling.
 Williamsport, Pa., R. Hawley.
 Winona, Minn., D. Sinclair.
 Wooster, Ohio, P. C. Given.
 Worcester, Mass., J. Pickett.
 Zanesville, Ohio, W. S. Harlan.

The following officers receive and retain, subject to the warrants of the Post Office Department, the funds of such post-offices as are instructed to deposit in their hands, viz :

The Treasurer of the United States at Washington, D. C.

The assistant treasurers of the United States at

New York, N. Y.
 Baltimore, Md.
 New Orleans, La.

Cincinnati, Ohio.
 Saint Louis, Mo.
 Philadelphia, Pa.

Boston, Mass.
 Chicago, Ill.
 San Francisco, Cal.

Ninety-nine post-offices are draft-offices, and during the year paid 23,350 drafts, issued by the Postmaster-General, countersigned, entered, and sent out by the Auditor, for sums in the aggregate of.....	\$2,317,247 33
Nine thousand one hundred and four are deposit-offices, a portion of which during the year deposited with the Treasurer and assistant treasurers of the United States the sum of	5,119,524 96
Thirty thousand four hundred and sixty-three offices are collection-offices and paid on collection-orders issued to mail-contractors the sum of	5,080,414 34
One thousand two hundred and forty-six are special offices, and derive their mail supplies by the payment of the revenue of their offices therefor, amounting to	36,222 29
Four thousand six hundred and sixty post-offices are supplied by mail-messengers, for which service there was paid during the year	660,476 54

REVENUE ACCOUNT OF THE POST-OFFICE DEPARTMENT.

The revenue of the department for the fiscal year ended June 30, 1879, was	\$30,041,982 44
The amounts placed in the Treasury for the service of the department for the fiscal year, being grants in aid of the revenue under the following acts of Congress, were—	
Under the second section of the act approved June 17, 1878, for supplying deficiencies in the revenues of the Post-Office Department for the fiscal year ended June 30, 1879	\$3,000,000 00
Under the act approved June 28, 1879, an additional sum for the payment of letter-carriers for the fiscal year ended June 30, 1879	71,000 00
	<hr/> 3,071,000 00
Aggregate of revenue and grants	33,112,982 44
The expenditures of the department for the fiscal year ended June 30, 1879, were	33,073,437 34
	<hr/> 39,545 04
Excess of receipts	
Amount charged to "bad debts" and "compromise" accounts ..	9,771 53
Deduct amount credited to "suspense" account.....	1,755 12
	<hr/> 8,016 41
The balance available to meet accrued liabilities for the fiscal year 1879, is	31,286 66

At the commencement of the fiscal year 1879 there was a balance available for accrued liabilities, under appropriation for 1878, of \$153,777 08
 Additional amounts have been placed in the Treasury on account of 1878, as follows:

Under the act approved June 19, 1878 (private No. 205),
 for the relief of H. G. Boardman, postmaster at Mil-
 ton, Vermont \$116 34
 Under the act approved March 3, 1879, to supply a defi-
 ciency in the appropriation for transportation on
 railroads for the fiscal year 1878 166,392 27
 166,508 61

Total for 1878 325,285 69
 During the last fiscal year there has been paid on account of 1878 143,018 72
 Balance available for 1878 182,266 97

At the commencement of the fiscal year 1879 there remained on hand a
 balance unexpended for 1877 of 278,209 14
 During the year there has been paid on account of 1877 173,132 71

Balance to be covered into the Treasury 105,076 43

The following amounts were placed in the Treasury for the payment
 of certain audited claims for services rendered during 1876 and prior
 years:

Under act approved March 3, 1879 (deficiency) \$45,873 31
 Under act approved March 3, 1879 (sundry civil) for relief of
 George H. Giddings 14,583 33
 \$60,456 64
 There has been paid under said acts 60,310 20
 Balance available for claims appropriated for 146 44

SUMMARY OF REVENUES AND EXPENDITURES.

Revenue for 1879 \$30,041,982 86
 Grants from the Treasury for 1879 \$3,071,000 00
 Grants from the Treasury for 1878 166,508 61
 Grants from the Treasury for 1876 and prior years.. 60,456 64
 3,297,965 25

Total receipts 33,339,948 11
 Expenditures for 1879 \$33,073,437 82
 Expenditures for 1878 143,018 72
 Expenditures for 1877 173,132 71
 Expenditures for 1876 and previous years 60,310 20

Total expenditures 33,449,899 45

Net amount charged to bad debt and compromise accounts during
 1879 109,951 34
 8,016 41

Excess of expenditures 117,967 75

The balance standing to the credit of the general revenue
 account at the close of the fiscal year ended
 June 30, 1878, as per last report, was \$3,246,056 14
 Deduct excess of expenditures during the year 1879. 117,967 75

Leaving to the credit of the revenue account at close of fiscal year
 ended June 30, 1879 3,128,088 39
 Due by late postmasters, accounts in suit \$245,694 47
 accounts not in suit 233,037 01
 478,731 48

Due late postmasters on accounts not closed 2,649,356 91
 46,250 70

2,695,607 61

DEFICIENCY APPROPRIATIONS.

The amount appropriated to supply deficiencies in the revenues for the fiscal year ended June 30, 1879, was :

General deficiency	\$4,222,274 72
Deficiency in letter-carriers' appropriation	71,000 00
Deficiency in railroad transportation	450,000 00
	<u>\$4,743,274 72</u>

The amount placed with the Treasurer of the United States to the credit of the Post-Office Department during the fiscal year, being "grants from the Treasury," was	3,071,000 00
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The amount remaining to the credit of the deficiency appropriations, subject to requisition as deficiencies for 1879 appear, is	1,672,274 72
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The net revenues of the department from postages, being the aggregate of balances due the United States by postmasters on the adjustment of their quarterly accounts for the year, after deducting their compensation and the expenses of their offices, was :

For the quarter ended September 30, 1878	\$4,126,634 24
For the quarter ended December 31, 1878	4,657,954 39
For the quarter ended March 31, 1879	4,956,945 00
For the quarter ended June 30, 1879	4,532,632 24
Total	<u>18,274,166 55</u>

The amount of letter postages paid in money was :

For the quarter ended September 30, 1878	\$56,290 42
For the quarter ended December 31, 1878	53,571 14
For the quarter ended March 31, 1879	75,710 61
For the quarter ended June 30, 1879	68,721 24
Total	<u>254,901 41</u>

The amount of stamps, stamped envelopes and wrappers, newspaper and periodical stamps, and postal cards sold was :

For the quarter ended September 30, 1878	\$6,642,842 02
For the quarter ended December 31, 1878	6,961,539 40
For the quarter ended March 31, 1879	7,500,809 25
For the quarter ended June 30, 1879	7,039,874 19
Total	<u>28,145,074 86</u>

The amount of official stamps furnished the different departments and included in the above amount of stamps sold was :

For the Treasury Department	\$200,000 00
For the War Department	141,497 40
For the Navy Department	6,950 00
For the Interior Department	35,980 40
For the Department of Justice	3,020 00
For the Department of Agriculture	40 00
Total	<u>386,487 80</u>

The number of quarterly returns of postmasters received and audited, on which the sum of \$18,274,166.55 was found due the United States was :

For the quarter ended September 30, 1878	328,303
For the quarter ended December 31, 1878	30,582
For the quarter ended March 31, 1879	40,317
For the quarter ended June 30, 1879	40,100
Total	<u>439,302</u>

MAIL TRANSPORTATION.

The amount charged to transportation accrued and placed to the credit of mail contractors and others for mail transportation during the fiscal year was :

For the regular supply of mail-routes	\$16, 115, 514 18
For the supply of "special" and mail-messenger offices	698, 216 94
For the salaries of postal railway clerks, route and other agents	2, 666, 315 65
For the salaries and per diem of the assistant superintendents of the postal railway service	38, 187 51
Total	19, 518, 234 28

Foreign mail transportation :

New York, Great Britain and Ireland	\$126, 019 15
New York, Great Britain and Germany	44, 812 22
New York, San Francisco, West Indies, Central and South America	33, 705 48
New York and Newfoundland	15 85
Boston, Great Britain and Ireland	1, 194 42
Boston and Nova Scotia	148 21
Boston and West Indies	12 22
Philadelphia and England	1, 531 09
Philadelphia and West Indies	1 27
Baltimore and Bremen	13 68
New Orleans, West Indies, Mexico, and Honduras	233 41
San Francisco, Central and South America, China, Japan, Farther India, Australia, and South Sea Islands	15, 060 45
Post-Office Department of Canada—English mails	803 50
Upper Pacific coast-local mails	132 52
Expenses of government mail-agent at Panama	1, 446 00
Expenses of government mail-agent at Aspinwall	940 00
	226, 069 47
	19, 744, 303 75

The amount credited to transportation accrued and charged to contractors for overcredits for "fines and deductions" was

174, 251 36

Net amount to the credit of mail contractors

19, 570, 052 39

The amount paid during the year was

19, 193, 288 19

Excess of transportation accrued

376, 764 20

The following balances, accrued for transportation of the mails on railroads, have been certified to the Secretary of the Treasury, to be carried to the credit of the companies named, under the act of March 3, 1879, and instructions contained in the Secretary's letter of May 19, 1879. The amounts are *not* included in the total of "railroad transportation paid" (see Statutes, vol. 20, page 420).

Union Pacific Railroad Company, first and second quarters 1879	\$188, 367 28	
Central Pacific Railroad Company, first and second quarters 1879	170, 909 75	Previous years.. \$7, 233 81
Kansas Pacific Railroad Company, first and second quarters 1879	43, 126 93	Previous years.. 298, 473 17
Sioux City and Pacific Railroad Company, first and second quarters 1879	4, 098 36	
Total	406, 502 33	305, 706 98

STATEMENT OF COLLECTING DIVISION.

Balance due United States brought forward from last report	\$498,563 92	
Balance due United States on account of postmasters becoming late during the fiscal year	321,073 49	
		819,637 41
Amount collected during the year	\$329,379 28	
Amount credited to "suspense"	1,755 12	
Amount charged to bad and compromise debts	9,771 53	
		340,905 93
Balance remaining due United States		478,731 48
Of which there is in suit	245,694 47	
Not in suit	233,037 01	
		478,731 48
Balance due late postmasters brought forward from last report	47,292 21	
Amount becoming due during the fiscal year	32,722 77	
		80,014 98
Amount paid during the year	33,764 28	
		46,250 70
Balance remaining due late postmasters		255,442 45
Amount in suit June 30, 1878	12,865 45	
Amount submitted for suit during the fiscal year		268,307 90
Of which there was collected during the year	16 261 69	
Amount otherwise settled	6,351 74	
		22,613 43
Balance remaining in suit		245,694 47
Amount collected from late postmasters on account of interest and costs ..		3,310 02

ACCUMULATION OF VALUELESS FILES.

I have the honor to call your attention to the vast accumulation of accounts current, money-order statements, paid money-orders, and other papers in the files of this office, to which reference is never had, and which are occupying rooms very much needed for the current files.

I suggest that Congress be requested to grant to the Postmaster-General authority to destroy or sell as waste paper all returns, statements, and paid money-orders pertaining to the accounts of postmasters which have been finally settled and closed, and which have been in the files not less than ten years. The ledgers and registers of this office will show the accounts as audited, and all necessary information can be obtained from them, the papers above mentioned being the postmasters' returns to this office on which their accounts were audited and settled.

The accompanying tables, numbered from 1 to 31, inclusive, exhibit in detail the transactions of the department for the fiscal year.

I have the honor to be, very respectfully,

J. M. MCGREW,
Auditor.

Hon. D. M. KEY,
Postmaster-General.

No. 1.—*Statement exhibiting quarterly the receipts of the Post-Office Department, under their several heads, for the fiscal year ended June 30, 1879.*

Accounts.	Quarter ended September 30, 1878.	Quarter ended December 31, 1878.	Quarter ended March 31, 1879.	Quarter ended June 30, 1879.	Aggregate.
Letter postage	\$56,898 42	\$53,571 14	\$75,710 61	\$68,721 24	\$254,901 41
Box-rents and branch offices	346,692 04	343,349 83	345,498 55	345,622 09	1,381,162 51
Fines and penalties	3,789 04	1,107 39	1,805 34	2,578 35	9,080 12
Postage-stamps, stamped envelopes and wrappers, and postal cards	6,642,842 02	6,961,539 49	7,500,809 29	7,039,884 19	28,145,074 99
Dead letters	957 30	575 95	514 53	1,275 61	3,323 39
Revenue from money-order business				219,226 83	219,226 83
Miscellaneous	6,864 17	4,058 25	5,929 77	12,361 42	29,213 61
Total	7,058,042 99	7,364,202 05	7,930,068 09	7,689,689 73	30,041,982 86

J. M. MCGREW, Auditor.

OFFICE OF THE AUDITOR OF THE TREASURY
FOR THE POST-OFFICE DEPARTMENT, October 29, 1879.



No. 2.—Statement exhibiting quarterly the expenditures of the Post-Office Department, under their several heads, for the fiscal year ended June 30, 1879.

Appropriations.

	Quarter ended September 30, 1878.	Quarter ended December 31, 1878.	Quarter ended March 31, 1879.	Quarter ended June 30, 1879.	Total expendi- tures on ac- count of 1879.	Expended on ac- count of pre- vious years.	Aggregate ex- penditures.
Compensation of postmasters.....	\$1,721,338 22	\$1,775,548 80	\$1,853,762 50	\$1,831,580 66	\$7,182,239 27	\$3,300 48	\$7,185,539 75
Compensation of clerks for post-offices.....	837,757 65	846,975 78	856,098 60	874,472 57	3,413,285 90	3,825 90	3,417,121 80
Compensation of letter-carriers and incidental expenses.....	461,435 20	469,758 97	469,929 49	546,582 05	1,947,706 61	.....	1,947,706 61
Wrapping paper.....	4,259 00	3,378 00	3,731 43	7,069 28	18,577 71	.....	18,577 71
Twine.....	9,466 99	12,570 00	11,059 60	12,260 29	45,375 88	.....	45,375 88
Postmarking and cancelling stamps.....	3,672 73	3,036 70	2,660 25	2,378 75	11,967 45	.....	11,967 45
Letter-balloons.....	1,541 00	83 25	286 00	1,629 00	3,501 25	1,518 00	5,019 25
Lead, light, and fuel for post-offices.....	86,523 61	97,722 83	89,699 89	90,747 54	364,693 87	487 02	364,950 89
Stationery.....	8,469 87	9,864 86	12,903 58	12,182 24	43,420 56	88 92	43,509 48
Furniture for post-offices.....	2,223 35	1,928 32	2,262 00	4,961 64	11,375 51	10 00	11,385 51
Miscellaneous, office of First Assistant Post- master-General.....	19,131 12	20,767 02	20,940 42	15,051 95	75,890 51	106 81	75,997 32
Island mail transportation, railroad.....	2,325,606 11	2,363,447 08	2,102,235 85	2,249,415 03	9,100,706 67	278,306 11	9,377,012 78
Island mail transportation, steam.....	1,242,055 03	1,319,767 59	1,456,216 89	1,525,265 77	5,537,245 28	44,857 60	5,582,202 88
Island mail transportation, steamboat.....	161,145 38	167,058 67	153,869 04	183,034 75	665,107 84	.....	665,107 84
Compensation of railway post-office clerks.....	341,257 05	346,874 77	332,463 90	320,768 42	1,341,364 14	1,292 57	1,342,656 71
Compensation of route-agents.....	261,223 63	265,662 14	254,967 33	253,908 81	1,035,801 91	.....	1,035,801 91
Compensation of mail-ports messengers.....	40,235 72	42,572 46	45,981 06	42,432 08	171,241 32	222 83	171,464 15
Compensation of local agents.....	199,851 21	30,250 45	28,922 66	27,153 53	116,302 88	125 00	116,302 88
Compensation of mail messengers.....	161,910 11	161,577 00	163,481 26	169,905 67	656,874 04	5,156 04	662,030 08
Mail locks and keys.....	32,762 66	17 30	13,053 25	48,598 88	136,615 28	40	136,615 28
Mail bags and twine.....	8,840 62	8,969 14	30,968 20	23,267 47	41,097 23	.....	41,097 23
Post-route maps.....	34,240 73	34,052 78	35,819 48	36,197 26	140,310 25	200 00	140,510 25
Mail depredations and special agents, includ- ing rewards.....	557 90	1,869 55	614 04	1,770 90	4,812 39	.....	4,812 39
Fees to United States marshals, attorneys, clerks of courts, and counsel.....	18,185 24	19,707 48	19,170 13	21,462 03	78,534 88	300 00	78,834 88
Postage-stamps.....	1,827 00	1,837 87	1,821 00	1,987 67	7,503 54	.....	7,503 54
Distribution of postage-stamps.....	107,874 86	105,150 72	116,604 20	72,432 75	402,152 64	.....	402,152 64
Stamped envelopes and newspaper wrappers.....	3,910 00	3,740 00	5,112 22	2,497 15	15,259 37	90 85	15,350 22
Distribution of stamped envelopes and new- spaper wrappers.....	33,969 05	40,563 90	40,548 25	30,270 79	154,281 96	.....	154,281 96
Postal cards.....	1,373 76	1,362 30	1,851 96	1,125 54	5,713 55	96 90	5,810 45
Registered package envelopes, books, and seals.....	7,035 00	4,479 00	4,903 20	4,903 20	18,259 83	.....	18,259 83
Official and post-letter envelopes.....	3,841 40	4,261 85	4,803 60	17,295 96	29,792 80	.....	29,792 80
Manila envelopes, and way letters.....	514 10	622 28	373 83	410 22	1,920 43	.....	1,920 43
Engraving, printing, and binding drafts and warrants.....	229 70	294 80	437 10	.....	960 60	.....	960 60
Advertising.....	4,051 73	3,062 82	5,347 40	11,372 30	25,354 25	646 08	25,999 33
Miscellaneous, office of Postmaster-General.....	4,190 66	5,340 20	3,960 40	4,111 66	1,402 82	.....	1,402 82

Foreign mail transportation	44,223 68	58,578 07	56,034 38	43,027 90	203,917 03	38,152 07	240,069 10
Balances due foreign countries	20 00	11,041 88	10,880 91	9,883 92	31,832 72	1,016 19	32,848 91
Laws and regulations of the Post-Office Department, editions of 1879			1,153 77	17,046 74	18,202 51		18,202 51
Total	8,017,331 58	8,262,063 35	8,254,377 28	8,539,665 61	33,073,437 82	376,461 63	33,449,899 45

In above amount paid for railroad transportation is not included \$406,502.22 for 1879, and \$305,706.98 for previous years, certified to the Secretary of the Treasury, to be credited to the credit of Pacific railroad companies, under act of March 3, 1879. For detailed statement see revenue account, page 297.

OFFICE OF THE AUDITOR OF THE TREASURY
FOR THE POST-OFFICE DEPARTMENT, October 23, 1879.

J. M. MCGREW, Auditor.

No. 3.—Statement of the postal receipts and expenditure of

States and Territories.	Letter-postage.	Waste-paper and twine.	Box rents and branch offices.	Postage-stamps, stamped envelopes, and postal cards.	Total receipts.
Maine	\$1,478 43	\$89 33	\$24,548 68	\$451,372 36	\$477,488 80
New Hampshire	537 42	117 58	15,483 76	275,352 85	291,491 61
Vermont	472 90	92 74	11,221 83	251,663 44	263,450 61
Massachusetts	10,782 98	1,250 09	112,837 25	1,982,377 96	2,067,228 30
Rhode Island	917 80	97 15	19,780 54	202,552 14	223,347 63
Connecticut	3,043 40	175 22	41,422 07	576,003 29	620,643 98
New York	66,721 89	3,340 33	175,070 42	5,465,178 11	5,710,310 75
New Jersey	2,616 44	164 97	25,125 90	591,200 61	619,107 92
Pennsylvania	18,729 41	1,256 31	92,497 21	2,620,110 96	2,732,593 88
Delaware	295 84	15 60	1,537 11	72,304 02	74,152 57
Maryland	5,248 34	96 98	10,354 04	524,488 77	540,188 13
Virginia	2,352 62	57 38	11,727 46	435,468 67	449,606 12
West Virginia	862 65	80 49	3,894 84	149,058 04	153,896 03
North Carolina	946 98	39 02	8,081 04	211,212 89	220,279 93
South Carolina	596 98	19 44	6,494 04	174,679 84	181,780 30
Georgia	1,841 86	240 16	17,754 02	333,262 53	353,068 11
Florida	647 80	12 24	5,135 74	83,032 80	88,828 58
Ohio	7,975 70	1,137 38	81,817 60	1,885,509 60	1,976,440 37
Michigan	5,257 82	574 30	64,582 41	934,072 56	1,004,487 09
Indiana	3,037 02	425 04	46,270 44	778,999 25	828,731 75
Illinois	22,522 07	2,120 04	105,728 72	2,268,248 30	2,398,627 33
Wisconsin	3,205 11	304 19	40,731 06	686,139 49	730,379 85
Iowa	3,875 58	326 74	66,939 59	869,213 98	940,355 10
Missouri	9,917 30	697 39	32,441 23	1,081,490 09	1,124,555 01
Kentucky	2,740 16	183 25	16,759 48	432,079 56	451,762 45
Tennessee	2,068 37	117 70	10,623 41	315,894 88	328,704 36
Alabama	1,274 24	41 49	11,626 96	224,570 16	237,512 45
Mississippi	716 21	37 00	12,585 35	162,267 17	175,605 72
Arkansas	460 65	38 27	9,678 75	144,504 98	154,662 65
Louisiana	2,934 57	56 15	18,611 05	268,117 69	289,719 46
Texas	3,963 50	168 58	43,604 38	458,939 13	506,675 59
California	7,170 68	220 76	66,696 98	860,151 54	934,239 96
Oregon	203 53	48 96	11,616 29	112,770 76	124,639 54
Minnesota	4,280 99	152 97	26,864 60	414,861 93	446,100 49
Kansas	1,539 76	184 59	32,316 40	470,172 68	504,213 43
Nebraska	1,307 27	66 63	15,268 02	237,442 06	254,083 96
Nevada	385 16	21 99	13,812 26	80,763 45	94,962 86
Colorado	855 93	149 00	28,348 06	192,673 62	222,124 91
Utah	317 34	41 48	5,778 51	74,550 66	80,686 99
New Mexico	19 14	9 80	1,591 75	19,366 34	20,967 03
Washington	78 59	4 17	8,137 12	39,209 37	42,429 25
Dakota	287 36	13 46	6,247 52	74,755 99	81,264 33
Arizona	89 06	41 58	1,993 40	21,204 90	23,329 03
Idaho	33 89	16 17	1,996 98	22,766 31	24,813 35
Wyoming	73 20	3 14	2,934 35	27,192 70	30,203 39
Montana	54 08	18 30	6,194 48	37,993 48	44,260 34
Alaska	06			53 43	53 49
District of Columbia	3,870 57	280 46	5,054 74	183,519 10	192,704 27
Deduct miscellaneous items	208,648 15	14,636 01	1,380,803 84	27,758,812 94	29,392,900 94
Add miscellaneous items	46,253 26		358 67	386,262 05	432,873 98
	254,901 41	14,636 01	1,381,162 51	28,145,074 99	29,796,774 92

NOTE.—The following items of expenditure and revenue, being of a general nature, are not embraced

Amount paid for foreign mails and expenses of government agent	\$240,000 10
Balances due foreign countries	32,848 81
Ship, steamboat, and way letters	1,820 43
Wrapping-paper	18,877 71
Twine	45,375 80
Post-route maps	41,697 23
Advertising	13,914 43
Mail-bags and catchers	90,002 16
Salary per diem of assistant superintendents of the postal-railway service	28,167 51
Mail locks and keys	13,100 55
Postmarking and canceling stamps	11,907 45
Mail depreciations and special agents	146,510 25
Letter-balances	5,019 25
Expenses of postage-stamps, stamped envelopes, and postal cards	663,835 00
Dead letters, official and registered package envelopes	48,652 43
Miscellaneous and sundry payments	44,388 00
Excess of expenditures brought down	2,572,610 45

POSTAL RECEIPTS AND EXPENDITURES.

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the United States for the fiscal year ended June 30, 1879.

Compensation of postmasters.	Clerks for offices, rent, light, and fuel, and incidental expenses of post-offices.	Compensation of letter-carriers.	Compensation of route-agents, postal-railway clerks, mail messengers, and supply of special offices.	Transportation by States.	Total expenses.	Excess of expenditures over receipts.	Excess of receipts over expenditures.
\$165,913 67	\$45,558 08	\$10,845 83	\$45,096 00	\$221,236 60	\$488,650 18	\$11,161 38	
113,639 01	18,886 40	3,841 08	18,452 51	101,547 67	256,366 67		\$35,124 94
111,405 90	14,432 17		16,603 43	144,439 58	286,881 08	23,430 47	
845,655 02	314,239 37	180,645 24	251,836 57	322,407 37	1,426,783 57		660,444 73
38,636 61	27,876 62	18,133 07	8,908 76	39,780 09	133,335 09		90,012 54
163,536 69	66,714 26	19,800 68	50,143 97	205,197 52	505,393 12		115,250 86
714,228 54	1,079,501 10	544,556 09	373,310 55	1,447,363 74	4,158,960 60		1,551,350 15
179,787 40	43,402 15	55,092 74	33,272 23	225,580 28	537,134 80		81,973 12
565,387 71	342,394 75	289,304 70	280,049 71	842,035 38	2,329,172 25		403,421 64
22,060 14	5,563 76	7,575 10	9,773 96	24,342 56	69,315 52		4,837 05
86,846 32	76,444 32	57,071 46	54,804 32	307,141 91	582,308 33	42,120 20	
154,156 84	46,633 43	19,771 49	40,912 13	394,575 37	656,049 26	206,443 13	
60,894 22	12,785 50	4,684 02	13,166 88	108,066 76	199,597 38	45,701 36	
95,370 09	18,721 27		36,395 01	222,209 42	372,695 79	152,415 86	
62,467 32	12,753 25	6,057 97	18,402 69	124,899 12	224,760 35	42,980 05	
113,315 61	45,839 30	9,075 92	62,986 38	274,727 42	505,944 63	152,856 46	
39,479 48	7,467 11		15,070 03	141,914 96	203,931 58	115,103 00	
459,779 16	215,959 39	123,682 63	476,334 18	1,228,540 67	2,504,206 73	527,766 36	
321,894 41	88,402 68	33,540 42	88,521 33	410,957 06	943,315 90		61,171 19
282,589 84	83,810 63	38,350 94	103,908 70	423,627 99	932,288 10	103,556 35	
531,849 60	400,891 86	157,425 13	350,924 20	1,009,604 53	2,450,695 32	52,067 99	
245,766 01	65,540 70	23,836 58	60,176 86	351,081 03	746,401 17	10,021 32	
361,142 34	64,598 33	19,595 45	100,779 66	454,866 96	1,000,982 74	60,626 85	
239,424 75	161,078 22	109,176 60	197,161 31	745,474 73	1,455,319 61	330,764 60	
133,682 37	43,988 96	30,225 95	42,941 40	313,351 44	564,170 12	112,407 67	
93,604 68	44,359 31	17,452 88	69,379 41	218,868 42	453,664 70	124,960 34	
103,361 73	24,356 98	4,004 14	28,342 67	268,858 03	418,923 55	181,410 70	
88,653 54	14,307 58		13,001 44	178,562 10	294,524 66	118,918 93	
72,864 53	16,183 51		21,625 89	372,749 73	483,423 66	328,741 01	
54,000 37	62,465 57	39,520 29	21,761 80	235,276 53	413,024 56	123,305 10	
187,368 59	60,259 42		40,375 88	778,603 69	1,066,907 58	559,931 99	
197,859 41	130,158 47	52,585 51	80,574 92	880,062 53	1,341,240 84	407,010 88	
44,950 13	9,645 35		11,806 91	155,028 81	221,425 20	96,785 66	
151,488 48	41,728 63	15,676 65	54,840 93	219,156 51	482,891 20	36,730 71	
202,507 49	37,242 79	3,678 75	66,873 12	405,678 01	715,990 16	211,766 73	
93,828 38	19,271 02	4,604 19	56,735 35	522,673 97	697,112 91	443,028 93	
38,226 52	10,504 43		2,376 22	149,867 29	200,974 46	105,991 00	
61,742 08	28,671 53		24,273 99	238,956 40	353,644 00	131,519 09	
34,565 51	9,894 51		9,592 49	200,673 78	254,726 29	174,029 30	
12,988 61	1,672 00		86 91	150,799 83	165,547 35	144,560 32	
20,336 74	1,514 88		4,620 54	100,497 24	126,989 40	84,540 15	
33,177 03	4,963 18		2,106 20	147,232 87	187,489 28	106,224 95	
11,789 41	1,362 00		23 83	146,803 76	159,969 00	186,639 97	
13,348 20	1,239 00		249 68	103,273 35	118,110 23	93,296 88	
13,510 60	3,615 25		252 35	62,035 36	79,413 56	49,210 17	
21,602 93	4,707 50		22 89	99,141 62	125,474 94	81,214 60	
23 26					23 26		30 23
3,675 18	94,781 73	36,449 10	94,713 85		229,619 86	36,914 99	
7,160,577 14	3,926,358 25	1,942,261 20	3,363,563 98	15,732,679 97	32,125,440 54	5,706,156 05	3,003,616 45
24,962 61	16,985 38	5,445 41	968 61	194,583 22	242,945 23	242,945 23	432,873 98
7,185,539 75	3,943,343 63	1,947,706 61	3,364,532 59	15,927,263 19	32,368,385 77	6,009,101 28	3,436,490 43

in the above statement, viz:

Receipts on account of dead letters	3,823 39
Receipts on account of fines and penalties	9,080 12
Receipts on account of miscellaneous	14,577 60
Receipts on account of money-order business	219,226 83
Excess of transportation accrued	376,764 20
Total excess of expenditures over receipts	3,407,916 59

4,030,888 73

J. M. McGREW, Auditor.

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No. 4.—Comparative statement of receipts and expenditures of the Post-Office Department from July 1, 1836, to June 30, 1879.

Year.	Receipts.			Expenditures
	Revenue.	Treasury grants.	Total.	
1837	\$4,945,668 21		\$4,945,668 21	\$3,288,319 03
1838	4,238,733 46		4,238,733 46	4,430,662 21
1839	4,484,656 70		4,484,656 70	4,636,536 31
1840	4,543,521 92		4,543,521 92	4,718,235 64
1841	4,407,726 27	\$482,657 00	4,890,383 27	4,489,527 61
1842	4,546,849 65		4,546,849 65	5,674,751 80
1843	4,296,225 43		4,296,225 43	4,374,753 71
1844	4,237,287 83		4,237,287 83	4,206,512 70
1845	4,289,841 80		4,289,841 80	4,320,731 99
1846	3,487,199 35	750,000 00	4,237,199 35	4,076,036 91
1847	3,880,309 23	12,500 00	3,892,809 23	3,979,542 19
1848	4,555,211 10	125,000 00	4,680,211 10	4,328,850 27
1849	4,705,176 28		4,705,176 28	4,479,049 13
1850	5,499,984 86		5,499,984 86	5,212,953 43
1851	6,410,604 33		6,410,604 33	6,278,401 66
1852	5,184,526 84	1,741,444 44	6,925,971 28	7,108,459 04
1853	5,240,724 70	2,225,000 00	7,465,724 70	7,982,756 50
1854	6,255,580 22	2,736,748 96	8,992,329 18	8,577,424 12
1855	6,642,136 13	3,114,542 26	9,756,678 39	9,964,342 29
1856	6,920,821 66	3,748,881 56	10,669,703 22	10,405,298 26
1857	7,353,951 76	4,528,004 67	11,881,956 43	11,508,057 93
1858	7,486,792 96	4,679,270 71	12,166,063 57	12,722,470 01
1859	7,968,484 07	3,915,946 49	11,884,430 56	11,458,083 63
1860	8,518,067 40	11,154,167 54	19,672,234 94	19,170,609 99
1861	8,349,296 40	4,639,806 53	12,989,102 93	13,600,759 11
1862	8,299,820 90	2,598,953 71	10,898,774 61	11,125,364 13
1863	11,163,789 59	1,007,848 72	12,171,638 31	11,314,206 84
1864	12,438,253 78	749,980 00	13,188,233 78	12,644,786 29
1865	14,556,158 70	3,968 46	14,560,127 16	13,694,728 28
1866	14,436,986 21		14,436,986 21	15,352,079 30
1867	15,297,026 87	3,991,666 67	19,288,693 54	19,235,483 46
1868	16,292,600 80	5,696,525 00	21,989,125 80	22,730,592 65
1869	18,344,510 72	5,707,115 30	24,051,626 02	23,698,131 50
1870	19,772,220 65	4,022,140 85	23,794,361 50	23,998,837 63
1871	20,037,045 42	4,126,200 00	24,163,245 42	24,390,104 09
1872	21,015,428 37	4,933,750 00	25,949,178 37	26,658,192 31
1873	22,996,741 57	5,900,475 00	28,897,216 57	29,064,945 67
1874	26,471,071 82	5,922,433 55	32,393,505 37	32,128,414 52
1875	26,791,360 59	6,704,646 96	33,496,007 55	33,611,309 45
1876	28,634,197 50	5,068,563 03	33,702,760 53	33,263,487 56
1877	27,531,585 26	7,013,300 00	34,544,885 26	34,496,322 44
1878	29,277,516 95	5,307,652 82	34,585,169 77	34,165,084 49
1879	30,041,982 86	3,297,965 25	33,339,948 11	33,449,899 45

J. M. McGREW, Auditor.

OFFICE OF THE AUDITOR OF THE TREASURY
FOR THE POST-OFFICE DEPARTMENT, October 20, 1879.

No. 5.—Statement in detail of miscellaneous payments made by the Post-Office Department for the fiscal year ended June 30, 1879, and charged to "Miscellaneous account First Assistant Postmaster-General."

AMOUNTS PAID BY WARRANT.

Date.	To whom allowed.	For what object.	Amount.
1878.			
July 1	M. V. Bailey, assistant superintendent railway mail service.	For telegrams, hotel expenses, and sleeping-car fare during the month of July, 1878.	\$17 82
Aug. 7	Thomas P. Cheney, assistant superintendent railway mail service.	For traveling expenses, hotel bills, and telegrams during the month of July, 1878.	42 00
7	W. L. Hunt, assistant superintendent railway mail service.	For sleeping-car fare, hotel bills, stationery, telegrams, and repair of electric pen during the month of July, 1878.	69 33
9	H. J. McKusick, assistant superintendent railway mail service.	For office rent, telegrams, and rollers and frames for maps during the month of July, 1878.	68 57
10	R. C. Jackson, assistant superintendent railway mail service.	For railway fare, hotel bills, painting letter-box at station, and telegrams during the month of July, 1878.	69 04

No. 5.—*Statement in detail of miscellaneous payments, &c.*—Continued.

AMOUNTS PAID BY WARRANT—Continued.

Date.	To whom allowed.	For what object.	Amount.
1878.			
Aug. 13	L. M. Terrell, assistant superintendent railway mail service.	For care of office, sleeping-car fare, printing, hotel bills, and telegrams during the month of July, 1878.	\$56 50
19	James E. White, assistant superintendent railway mail service.	For railway fare, printing, telegrams, board, hack hire, and portage during the month of July, 1878.	108 75
24	C. Jay French, assistant superintendent railway mail service.	For cleaning and fitting up office, railway fare, electric pen, printing, stamp-ribbon, hotel bills, and telegrams during the month of July, 1878.	89 61
Sept. 6	L. M. Terrell, assistant superintendent railway mail service.	For care of office, hotel bills, and telegrams during the month of August, 1878.	106 37
9	M. V. Bailey, assistant superintendent railway mail service.	For telegrams, parlor-car fare, sleeping-car fare, hotel bills, and meals, as per memorandum, during the month of August, 1878.	8 83
9	W. L. Hunt, assistant superintendent railway mail service.	For telegrams, supplies for electric pen, stamp-ribbon, and printing during the month of August, 1878.	57 00
11	R. C. Jackson, assistant superintendent railway mail service.	For telegrams, hotel bills, sleeping car fare, and putting up, lettering, and painting letter-boxes and sign during the month of August, 1878.	68 35
11	C. Jay French, assistant superintendent railway mail service.	For care of office, telegrams, printing, mounting schemes, supplies for electric pen, and office furniture during the month of August, 1878.	90 21
14	Thomas P. Cheney, assistant superintendent railway mail service.	For telegrams, printing, and personal expenses during the month of August, 1878.	47 03
21	James E. White, assistant superintendent railway mail service.	For telegrams, printing, paper, supplies for electric pen, sleeping-car fare, and miscellaneous expenses during the month of August, 1878.	67 99
Oct. 7	W. L. Hunt, assistant superintendent railway mail service.	For mounting maps, printing, and telegrams during the month of September, 1878.	99 74
7	L. M. Terrell, assistant superintendent railway mail service.	For telegrams and care of office during the month of September, 1878.	101 85
8	H. J. McKusick, assistant superintendent railway mail service.	For office rent, telegrams, hotel bills, and sundry other expenses during the month of August, 1878.	97 29
9	R. C. Jackson, assistant superintendent railway mail service.	For telegrams, railway fare, and hotel expenses during the month of September, 1878.	82 06
15	Thomas P. Cheney, assistant superintendent railway mail service.	For telegrams and traveling expenses during the months of August and September, 1878.	30 82
15	H. J. McKusick, assistant superintendent railway mail service.	For telegrams, rent of office, railway fare, hotel bills, and sundry other items during the month of September, 1878.	87 29
15	James E. White, assistant superintendent railway mail service.	For telegrams, printing, paper for circulars, hotel bills, railway fare, porter and hack hire during the month of September, 1878.	46 83
Nov. 5	E. W. Alexander, assistant superintendent railway mail service.	For railway fare during the month of September, 1878.	7 15
5	F. W. Schaute, special agent Post-Office Department.	For stationery during the month of October, 1878.	36 80
11	H. J. McKusick, assistant superintendent railway mail service.	For telegrams, rent of office, hotel bills, and hack hire during the month of October, 1878.	75 01
11	C. Jay French, assistant superintendent railway mail service.	For telegrams, sleeping-car fare, printing, and sundry traveling expenses during the month of September, 1878.	140 80
11	L. M. Terrell, assistant superintendent railway mail service.	For telegrams, care of office, and hotel expenses during the month of October, 1878.	84 20
11	James E. White, assistant superintendent railway mail service.	For sleeping-car fare, telegrams, paper for printing, and sundry traveling expenses during the month of October, 1878.	50 90
11	W. L. Hunt, assistant superintendent railway mail service.	For sleeping-car fare, telegrams, repair of electric pen, and sundry other expenses during the month of October, 1878.	109 31
13	Thomas P. Cheney, assistant superintendent railway mail service.	For telegrams and train schedules during the month of October, 1878.	25 06
14	R. C. Jackson, assistant superintendent railway mail service.	For telegrams, railway fare, hotel bills, printing, and sundry other expenses during the month of October, 1878.	81 90
19	W. B. Thompson, assistant superintendent railway mail service.	For telegrams, railway fare, hotel bills, and sundry items of expense incurred in traveling during the month of October, 1878.	60 09

No. 5.—Statement in detail of miscellaneous payments, &c.—Continued.

AMOUNTS PAID BY WARRANT—Continued.

Date.	To whom allowed.	For what object.	Amount.
1878. Dec. 2	M. V. Bailey, assistant superintendent railway mail service.	For telegrams, hotel expenses, and sleeping-car fare during the month of November, 1878.	\$11 3
6	L. M. Terrell, assistant superintendent railway mail service.	For telegrams, fuel, and care of office during the month of November, 1878.	53 3
9	R. C. Jackson, assistant superintendent railway mail service.	For telegrams, sleeping-car fare, and hotel expenses during the month of November, 1878.	53 0
11	W. L. Hunt, assistant superintendent railway mail service.	For telegrams, Mackinnon pen, zincs for electric pen, printing, and mounting schemes in office during the month of November, 1878.	44 2
11	H. J. McKusick, assistant superintendent railway mail service.	For telegrams, rent of office, hotel bills, livery hire, and sundry other expenses during the month of November, 1878.	44 0
24	.....do.....	For sundry necessary expenses incurred by him during the month of July, 1878.	75 0
31	M. V. Bailey, assistant superintendent railway mail service.	For sleeping-car fare, hotel bills, and portage during the month of December, 1878.	12 16
1879. Jan. 8	W. L. Hunt, assistant superintendent railway mail service.	For telegrams, printing, mounting schemes for office, and supplies for electric pen during the month of December, 1878.	31 3
9	L. M. Terrell, assistant superintendent railway mail service.	For telegrams, sleeping-car fare, care of office, printing, hotel bills, and supplies for electric pen during the month of December, 1878.	73 75
9	James E. White, assistant superintendent railway mail service.	For telegrams, supplies for electric pen, and printing schedules during the month of November, 1878.	21 2
13	R. C. Jackson, assistant superintendent railway mail service.	For telegrams, hotel expenses, sleeping-car fare, subscription to Railway Guide, meals and lunches during the month of December, 1878.	67 30
13	James E. White, assistant superintendent railway mail service.	For telegrams and supplies for electric pen during the month of December, 1878.	1 6
13	H. J. McKusick, assistant superintendent railway mail service.	For telegrams, hotel bills, office rent, and livery hire during the month of December, 1878.	100 41
13	Thomas P. Cheney, assistant superintendent railway mail service.	For telegrams and printing mail schedules during the month of December, 1878.	28 0
14	C. Jay French, assistant superintendent railway mail service.	For telegrams, cleaning and fitting up office, books, printing, mounting schemes, basket, and for heating office during the month of December, 1878.	66 0
18	O. H. Irish, Chief of Bureau of Engraving and Printing.	For altering dies, engraving, printing, numbering, and binding special agents' commissions during the month of December, 1878.	64 3
18	Thomas P. Cheney, assistant superintendent railway mail service.	For personal expenses, telegrams, and mail-train schedules during the month of December, 1878.	70 7
Feb. 4	Samuel M. Lake, Chief of Division of Inspection, Post-Office Department.	For railway fare, hotel bills, and street-car fare, while traveling under order of the Postmaster-General.	31 0
8	Thomas P. Cheney, assistant superintendent railway mail service.	For mail schedules, telegrams, railway fare, and other expenses during the month of January, 1879.	42 5
8	M. V. Bailey, assistant superintendent railway mail service.	For telegrams, hotel bills, sleeping-car fare, and miscellaneous expenses during the month of January, 1879.	27 7
10	W. L. Hunt, assistant superintendent railway mail service.	For telegrams, mounting map, and printing during the month of January, 1879.	25 0
11	L. M. Terrell, assistant superintendent railway mail service.	For telegrams, care of office, fuel, stationery, hotel expenses, railway fare, sleeping-car fare, and subsistence and portage while traveling during the month of January, 1879.	107 3
11	H. J. McKusick, assistant superintendent railway mail service.	For telegrams, hotel bills, office rent, and sundry other expenses, during the month of January, 1879.	50 0
13	James E. White, assistant superintendent railway mail service.	For telegrams during the month of January, 1879.	1 0
15	R. C. Jackson, assistant superintendent railway mail service.	For telegrams, hotel bills, stationery, sleeping-car fare, hardware, signs, and sundry other expenses during the month of January, 1879.	73 0

No. 5.—*Statement in detail of miscellaneous payments, &c.*—Continued.

AMOUNTS PAID BY WARRANT—Continued.

Date.	To whom allowed.	For what object.	Amount.
1879.			
Feb. 24	C. Jay French, assistant superintendent railway mail service,	For telegrams, cleaning office, printing, sleeping-car fare, hotel bills, and sundry other expenses during the month of January, 1879.	\$124 44
28	M. V. Bailey, assistant superintendent railway mail service.	For telegrams, sleeping-car fare, hotel bills, and miscellaneous expenses during the month of February, 1879.	12 00
Mar. 5	James E. White, assistant superintendent railway mail service.	For telegrams, paper for circulars, and freight during the month of February, 1879.	16 92
11	H. J. McKusick, assistant superintendent railway mail service.	For telegrams, office rent, railway fare, hotel bills, and other expenses during the month of February, 1879.	66 06
14	W. L. Hunt, assistant superintendent railway mail service.	For telegrams, printing, rubber signature, and supplies for electric pen during the month of February, 1879.	29 65
14	R. C. Jackson, assistant superintendent railway mail service.	For telegrams, sleeping-car fare, hanging maps, hotel bills, and other expenses during the month of February, 1879.	44 38
Apr. 4	James E. White, assistant superintendent railway mail service.	For telegrams, hotel bills, sleeping-car fare, hack hire, and printing during the month of March, 1879.	63 85
5	L. M. Terrell, assistant superintendent railway mail service.	For telegrams, care of office, fuel, printing, subsistence while traveling, and transfer fare during the month of March, 1879.	34 10
10	R. C. Jackson, assistant superintendent railway mail service.	For hotel expenses, sleeping-car fare, printing, and indexing order books during the month of March, 1879.	127 65
12	H. J. McKusick, assistant superintendent railway mail service.	For telegrams, office rent, and supplies for electric pen during the month of March, 1879.	63 63
12	M. J. Waldron, assistant superintendent railway mail service.	For telegrams during the month of March, 1879.	4 11
24	C. J. French, assistant superintendent railway mail service.	For telegrams, cleaning and heating office rooms, stationery, and printing, sleeping-car fare, and hotel bills during the month of February, 1879, and gas bills for one year from February 1, 1878.	219 34
May 5	L. M. Terrell, assistant superintendent railway mail service.	For care of office, sleeping-car fare, hotel bills, fuel, printing, subsistence, transfers, and telegrams during the month of April, 1879.	74 65
8	James E. White, assistant superintendent railway mail service.	For telegrams, sleeping-car fare, board, supplies for electric pen, and stamp, with outfit, during the month of April, 1879.	40 56
9	W. L. Hunt, assistant superintendent railway mail service.	For telegrams, printing, mounting schemes, hotel bills, and sundry other travelling expenses during the month of April, 1879.	76 05
12	C. Jay French, assistant superintendent railway mail service.	For telegrams, railway and sleeping-car fare, express charges, cleaning office, supplies for electric pen, and hotel bills during the month of April, 1879.	122 72
13	R. C. Jackson, assistant superintendent railway mail service.	For telegrams, sleeping-car and railway fare, hotel bills, and transient board during the month of April, 1879.	86 85
13	Thomas P. Cheney, assistant superintendent railway mail service.	For telegrams, printing, special transportation for mails, and lamp shade and chimney during the months of February and March, 1879.	86 20
15	H. J. McKusick, assistant superintendent railway mail service.	For telegrams, hotel bills, livery hire, and transient board and lodging during the month of April, 1879.	107 42
16	W. B. Thompson, assistant superintendent railway mail service.	For sundry printing material purchased for the use of the railway mail service, and paid from the appropriation for 1878.	39 27
19	Thomas P. Cheney, assistant superintendent railway mail service.	For telegrams, repair of electric pen, sleeping-car fare, hotel bills, and sundry other expenses during the month of April, 1879.	41 57
19	R. C. Jackson, assistant superintendent railway mail service.	For telegrams during the month of April, 1879.	17 40
27	H. J. McKusick, assistant superintendent railway mail service.	For meals, sleeping-car fare, and other necessary expenses incurred in traveling on official duties during the month of March, 1879.	83 50
June 2	M. V. Bailey, assistant superintendent railway mail service.	For telegrams, hotel bills, and sundry other expenses during the month of May, 1879.	50 22
4	W. L. Hunt, assistant superintendent railway mail service.	For telegrams, printing, and repair of electric pen during the month of May, 1879.	32 65

No. 5.—Statement in detail of miscellaneous payments, &c.—Continued.

AMOUNTS PAID BY WARRANT—Continued.

Date.	To whom allowed.	For what object.	Amount.
1879.			
June 7	James E. White, assistant superintendent railway mail service.	For telegrams, sleeping-car fare, and sundry expenses during the month of May, 1879.	\$30 29
7	W. B. Thompson, superintendent railway mail service.	For photographing the postal car General Crewell, at the Adrian, Michigan, shops.	10 00
9	R. C. Jackson, assistant superintendent railway mail service.	For telegrams, sleeping-car fare, hotel bills, <i>fac simile</i> stamp, and sundry other expenses during the month of May, 1879.	49 61
9	Thomas P. Cheney, assistant superintendent railway mail service.	For telegrams during the month of May, 1879.	15 69
11	H. J. McKusick, assistant superintendent railway mail service.	For telegrams and hotel bills during the month of March, and telegrams, hotel bills, rent of office, and sundry other expenses during the month of May, 1879.	91 22
11	A. G. Sharp, special agent Post-Office Department.	For printing during the month of May, 1879.	12 00
July 2	C. Jay French, assistant superintendent railway mail service.	For sleeping-car fare, telegrams, printing, stationery, negatives of postal car, and sample castings for postal car during the month of May, 1879.	123 37
8	James E. White, assistant superintendent railway mail service.	For telegrams, sleeping-car fare, paper for circulars, supplies for electric pen, and sundry other expenses during the month of June, 1879.	55 94
8	W. L. Hunt, assistant superintendent railway mail service.	For telegrams, sleeping-car fare, hack hire, supplies for electric pen, printing, and hotel bills during the month of June, 1879.	62 02
11	H. J. McKusick, assistant superintendent railway mail service.	For telegrams, rent of office, and sundry other expenses during the month of June, 1879.	62 68
12	R. C. Jackson, assistant superintendent railway mail service.	For telegrams, hotel bills, sleeping-car fare, and sundry other expenses during the month of June, 1879.	62 29
17	George C. Maynard, agent of Bell telephone.	For rent of telephones and telephone lines from May 15, 1879, to June 30, 1879.	36 06
Aug. 13	C. Jay French, assistant superintendent railway mail service.	For telegrams, sleeping-car fare, hotel bills, and stationery during the month of June, 1879.	57 52
16	Thomas P. Cheney, assistant superintendent railway mail service.	For telegrams, hotel bills, railway fare, carriage hire, and other expenses incurred in traveling during the month of June, 1879.	33 39
Sept. 3	C. Jay French, assistant superintendent railway mail service.	For sundry personal expenses during the month of June, 1879.	13 20

AMOUNTS PAID BY DRAFT.

1878.			
Aug. 7	W. B. Thompson, assistant superintendent railway mail service.	For telegraphing and expenses while traveling on railway mail service during July, 1878.	\$46 19
Sept. 7	.....do.....	For telegraphing and expenses while traveling on railway mail service during August, 1878.	100 06
Oct. 1	M. V. Bailey, assistant superintendent railway mail service.....	For telegraphing and expenses while traveling on railway mail service during September, 1878.	25 03
3	R. P. Eaton, assistant superintendent railway mail service.	For telegraphing and expenses while traveling on railway mail service in May and June, 1878.	33 50
3	.....do.....	For telegraphing and expenses while traveling on railway mail service in July, August, and September, 1878.	35 80
14	W. B. Thompson, assistant superintendent railway mail service.	For telegraphing and expenses while traveling on railway mail service during September, 1878.	84 90
Nov. 2	M. V. Bailey, assistant superintendent railway mail service.	For telegraphing and expenses while traveling on railway mail service during October, 1878.	24 17
Dec. 6	T. N. Vail, superintendent railway mail service.	For telegraphing and expenses while traveling on business of the Post-Office Department from July 1 to November 30, 1878.	135 64
10	C. Jay French, assistant superintendent railway mail service.	For telegraphing, tags, printing, &c., for use of railway mail service in October and November, 1878.	203 62

No. 5.—Statement in detail of miscellaneous payments, &c.—Continued.

AMOUNTS PAID BY DRAFT—Continued.

Date.	To whom allowed.	For what object.	Amount.
1878. Dec. 12	W. B. Thompson, assistant superintendent railway mail service.	For telegraphing and expenses while traveling on railway mail service during November, 1878.	\$84 52
1879. Jan. 8	W. G. Lovell, assistant superintendent railway mail service.	For plumbing and gas fixtures in office, telegraphing and expenses while traveling on railway mail service during December, 1878.	89 06
9	E. W. Alexander, assistant superintendent railway mail service.	For telegraphing on account of railway mail service in December, 1878.	7 30
17	F. W. Gannett, auditor of Union Pacific Railroad Company.	For telegraphing on account of railway mail service in November, 1878.	3 58
Feb. 8	W. G. Lovell, assistant superintendent railway mail service.	For telegraphing and expenses while traveling on railway mail service during January, 1879.	120 47
12	M. J. Waldron, assistant superintendent railway mail service.	For telegraphing on account of railway mail service during January, 1879.	2 94
21	L. M. Terrell, assistant superintendent railway mail service.	For expenses while traveling on railway mail service during January, 1879.	10 85
Mar. 10	W. G. Lovell, assistant superintendent railway mail service.	For light in office, in January and February, 1879, telegraphing, and expenses while traveling on railway mail service in February, 1879.	70 14
13	L. M. Terrell, assistant superintendent railway mail service.	For care of office, printing, telegraphing, and expenses while traveling on railway mail service during February, 1879.	55 70
Apr. 5	M. V. Bailey, assistant superintendent railway mail service.	For telegraphing and expenses while traveling on railway mail service during March, 1879.	26 15
7	W. L. Hunt, assistant superintendent railway mail service.	For telegraphing, printing, and expenses while traveling on railway mail service during March, 1879.	38 98
7	W. G. Lovell, assistant superintendent railway mail service.	For telegraphing and expenses while traveling on railway mail service during March, 1879.	62 03
May 1	M. V. Bailey, assistant superintendent railway mail service.	For telegraphing and expenses while traveling on railway mail service during April, 1879.	33 11
7	W. G. Lovell, assistant superintendent railway mail service.	For light for office, telegraphing, and expenses while traveling on railway mail service during April, 1879.	76 47
7	R. P. Eaton, assistant superintendent railway mail service.	For expenses while traveling on business of the Post-Office Department in April, 1879.	24 00
9	W. G. Lovell, assistant superintendent railway mail service.	For light and stationery for office, and expenses while traveling on railway mail service during May, 1879.	79 63
June 11	M. J. Waldron, assistant superintendent railway mail service.	For horse hire, in procuring evidence, in May, 1879.	5 00
July 9	W. G. Lovell, assistant superintendent railway mail service.	For telegraphing, gas for office, and personal expenses while traveling.	81 99
10	L. M. Terrell, assistant superintendent railway mail service.	For telegraphing, printing, care of office, and personal expenses.	130 55
Aug. 2	M. V. Bailey, assistant superintendent railway mail service.	For telegraphing and personal expenses while traveling.	132 15
12	M. J. Waldron, assistant superintendent railway mail service.	For maps and rollers for his office at Memphis, Tenn.	3 60
26	Hon. J. N. Tyner, First Assistant Postmaster-General.	For personal expenses on official visit to the Pacific coast, under orders of Postmaster-General.	681 00
			\$2,511 82

No. 5.—Statement in detail of miscellaneous payments, &c.—Continued.

AMOUNTS CREDITED POSTMASTERS ON THEIR GENERAL ACCOUNTS.

Date.	To whom allowed.	For what object.	Amount.
1878.			
Oct. 3	T. L. James, postmaster, New York, N. Y.	For amount paid for supplies for railway mail service, third quarter, 1878.	\$5 00
8	do	For personal expenses to Washington, by order of Postmaster-General.	72 25
5	do	For expenditures on account of railway mail service, third quarter, 1878.	14 00
15	J. M. Edmunds, postmaster, Washington, D. C.	For amount paid S. R. Kilby for expenses to New York, by order of Postmaster-General.	28 00
30	L. B. Stephens, postmaster, Ogden City, Utah.	For amount paid for telegraphing in second quarter, 1878.	2 25
30	W. R. Holloway, postmaster, Indianapolis, Ind.	For expenditures on account of railway mail service, third quarter, 1878.	192 15
31	E. S. Tobey, postmaster, Boston, Mass.	do	65 97
Nov. 9	William Rule, postmaster, Knoxville, Tenn.	do	80 00
9	C. I. Filley, postmaster, Saint Louis, Mo.	do	170 65
9	J. P. Woolfolk, postmaster, Jackson, Tenn.	do	30 00
9	E. S. Tobey, postmaster, Boston, Mass.	do	87 50
9	P. J. Poppo, postmaster, Dunkirk, N. Y.	do	37 50
9	Benjamin Conley, postmaster, Atlanta, Ga.	do	211 25
9	C. F. W. Kunst, postmaster, Grafton, W. Va.	do	45 00
12	C. H. Eddy, postmaster, Toledo, Ohio.	do	30 00
12	J. P. Loge, postmaster, Cincinnati, Ohio.	do	267 08
12	N. B. Sherwin, postmaster, Cleveland, Ohio.	do	649 02
13	James Coey, postmaster, San Francisco, Cal.	do	23 30
15	T. L. Case, postmaster, Kansas City, Mo.	do	200 00
16	James Coey, postmaster, San Francisco, Cal.	For expenditures on account of special agents Post-office Department, third quarter, 1878.	154 25
23	J. F. Wilson, postmaster, Lynchburg, Va.	For expenditures on account of railway mail service, third quarter, 1878.	25 00
26	T. F. Robley, postmaster, Fort Scott, Kans.	do	37 50
Dec. 3	E. T. Rowell, postmaster, Lowell, Mass.	For miscellaneous expenditures, third quarter, 1878.	2 00
4	A. C. Chase, postmaster, Syracuse, N. Y.	For miscellaneous expenditures in fiscal year ended June 30, 1878.	21 97
5	C. I. Filley, postmaster, Saint Louis, Mo.	For miscellaneous expenditures, third quarter, 1878.	126 50
9	J. Jessop, postmaster, York, Pa.	For amount paid for advertising arrival and departure of mails, third quarter, 1878.	5 00
13	G. W. Colbath, late postmaster, Dover, N. H.	For miscellaneous expenditures, third and fourth quarters, 1877.	7 00
16	T. C. Phillips, late postmaster, Bay City, Mich.	For miscellaneous expenditures, third and fourth quarters, 1877, and first and second quarters, 1878.	16 50
23	A. C. Chase, postmaster, Syracuse, N. Y.	For expenditures on account of railway mail service, third quarter, 1878.	62 50
1879.			
Jan. 3	T. L. James, postmaster, New York, N. Y.	For expenditures on account of railway mail service, fourth quarter, 1878.	112 50
4	do	do	22 50
6	F. W. Palmer, postmaster, Chicago, Ill.	do	26 25
8	C. F. W. Kunst, postmaster, Grafton, W. Va.	do	45 00
11	W. R. Holloway, postmaster, Indianapolis, Ind.	do	2 00
11	G. W. Grant, postmaster, Reading, Pa.	For amount paid for City Directory ordered for Dead-Letter Office.	2 50
11	James Coey, postmaster, San Francisco, Cal.	For expenditures on account of railway mail service, fourth quarter, 1878.	20 00
11	T. F. Robley, postmaster, Fort Scott, Kans.	do	5 00
5	Samuel Hays, postmaster, Saint Louis, Mo.	do	25 00

No. 5.—Statement in detail of miscellaneous payments, &c—Continued.

AMOUNTS CREDITED POSTMASTERS ON THEIR GENERAL ACCOUNTS—Continued.

Date.	To whom allowed.	For what object.	Amount.
1879.			
Jan. 27	E. S. Tobey, postmaster, Boston, Mass.	For expenditures on account of railway mail service, fourth quarter, 1878.	\$31 55
28	P. J. Popple, postmaster, Dunkirk, N. Y.	do	27 50
30	A. C. Chase, postmaster, Syracuse, N. Y.	do	62 50
30	James Coey, postmaster, San Francisco, Cal.	For expenditures on account of special agents and railway mail service, fourth quarter, 1878.	122 25
30	J. P. Loge, postmaster, Cincinnati, Ohio.	For expenditures on account of railway mail service, fourth quarter, 1878.	277 30
30	Benjamin Conley, postmaster, Atlanta, Ga.	do	127 40
30	do	For expenditures on account of special agents Post-Office Department, fourth quarter, 1878.	241 95
Feb. 4	N. B. Sherwin, postmaster, Cleveland, Ohio.	For expenditures on account of railway mail service, fourth quarter, 1878.	24 90
4	J. P. Loge, postmaster, Cincinnati, Ohio.	do	45 00
4	C. H. Eddy, postmaster, Toledo, Ohio.	do	30 00
4	J. P. Woolfolk, postmaster, Jackson, Tenn.	do	30 00
5	T. L. Case, postmaster, Kansas City, Mo.	do	200 00
8	A. D. H. Thompson, postmaster, Memphis, Tenn.	do	99 00
11	J. F. Wilson, postmaster, Lynchburg, Va.	do	25 00
12	H. H. Hamlin, postmaster, Augusta, Me.	For miscellaneous expenditures disallowed in returns for third quarter, 1878.	40 00
13	W. N. Denny, postmaster, Vincennes, Ind.	For expenditures on account of railway mail service, fourth quarter, 1878.	18 70
14	A. C. Chase, postmaster, Syracuse, N. Y.	do	57 85
14	F. H. Scanlan, postmaster, Houston, Tex.	do	41 50
17	N. B. Sherwin, postmaster, Cleveland, Ohio.	do	31 95
23	W. R. Holloway, postmaster, Indianapolis, Ind.	For miscellaneous expenditures in fourth quarter, 1878.	4 00
23	do	For miscellaneous expenditures in fiscal year, 1878.	4 00
23	T. F. Hall, postmaster, Omaha, Nebr.	For miscellaneous expenditures in fourth quarter, 1878.	4 00
23	G. H. Anderson, postmaster, Pittsburgh, Pa.	For miscellaneous expenditures in third quarter, 1878.	55 20
23	J. W. Knowlton, postmaster, Bridgeport, Conn.	For miscellaneous expenditures in first and second quarters, 1878.	4 13
24	W. R. Holloway, postmaster, Indianapolis, Ind.	For miscellaneous expenditures in fiscal year ended June 30, 1877.	4 00
Mar. 6	A. M. Patterson, postmaster, Crostline, Ohio.	For expenditures on account of railway mail service, fourth quarter, 1878.	45 00
7	Flelding Lowry, postmaster, Dayton, Ohio.	For amount paid for repairs of office and printing, third quarter, 1878.	134 65
7	Samuel Hays, postmaster, Saint Louis, Mo.	For amount paid for a marking stamp in fourth quarter, 1878.	11 00
7	J. W. Knowlton, postmaster, Bridgeport, Conn.	For miscellaneous expenditures, third and fourth quarters, 1878.	24 75
19	N. B. Sherwin, postmaster, Cleveland, Ohio.	For expenditures on account of railway mail service, fourth quarter, 1878.	137 36
19	H. B. Kinney, postmaster, Austin, Tex.	For expenditures on account of special agents Post-Office Department, third and fourth quarters, 1878.	94 50
19	William Rule, postmaster, Knoxville, Tenn.	For expenditures on account of special agents Post-Office Department, fourth quarter, 1878.	20 00
21	James McLeer, postmaster, Brooklyn, N. Y.	To amount paid janitor for fourth quarter, 1878.	12 00
April 3	T. L. James, postmaster, New York, N. Y.	For amount paid J. H. Purdy, for his personal expenses to Washington, D. C., by order of the Postmaster General.	27 00
8	do	For expenditures on account of railway mail service, first quarter, 1879.	106 31
14	Benjamin Conley, postmaster, Atlanta, Ga.	do	75 00

No. 5.—Statement in detail of miscellaneous payments, &c.—Continued.

AMOUNTS CREDITED POSTMASTERS ON THEIR GENERAL ACCOUNTS—Continued.

Date.	To whom allowed.	For what object.	Amount.
1878.			
April 14	Benjamin Conley, postmaster, Atlanta, Ga.	For amount paid for rent, repairs, and refitting office for special agents Post-Office Department, in fourth quarter, 1878, and first quarter, 1879.	\$241 25
14	J. P. Woolfolk, postmaster, Jackson, Tenn.	For expenditures on account of railway mail service, first quarter, 1879.	30 00
14	C. F. W. Kunst, postmaster, Grafton, W. Va.	do	45 00
14	T. F. Robley, postmaster, Fort Scott, Kan.	do	37 50
14	E. C. Sumner, postmaster, Denver, Colo.	For expenditures on account of special agents Post-Office Department, first quarter, 1879.	21 25
14	C. H. Eddy, postmaster, Toledo, Ohio.	For expenditures on account of railway mail service, first quarter, 1879.	30 00
14	F. W. Palmer, postmaster, Chicago, Ill.	do	445 00
14	do	For expenditures on account of special agents Post-Office Department, first quarter, 1879.	98 00
16	E. C. Sumner, postmaster, Denver, Colo.	For miscellaneous expenditures in fourth quarter, 1878.	126 00
18	Samuel Hays, postmaster, Saint Louis, Mo.	For expenditures on account of railway mail service, first quarter, 1879.	59 70
21	James Coey, postmaster, San Francisco, Cal.	do	150 38
23	William Rule, postmaster, Knoxville, Tenn.	do	40 00
23	E. S. Tobey, postmaster, Boston, Mass.	do	64 25
26	T. L. Jamea, postmaster, New York, N. Y.	For miscellaneous items short credited in returns for third quarter, 1878.	12
26	J. P. Logs, postmaster, Cincinnati, Ohio.	For expenditures on account of railway mail service, first quarter, 1879.	304 00
29	V. C. Thompson, postmaster, Louisville, Ky.	For amount paid for repairs of stamp in the fourth quarter, 1878.	2 65
30	J. T. Wilder, postmaster, Chattanooga, Tenn.	For expenditures on account of railway mail service, first quarter, 1879.	5 33
May 5	J. F. Wilson, postmaster, Lynchburg, Va.	do	28 75
6	T. S. Case, postmaster, Kansas City, Mo.	do	205 25
6	A. D. H. Thompson, postmaster, Memphis, Tenn.	do	45 00
6	H. B. Kinney, postmaster, Austin, Tex.	do	65 00
6	T. H. Scanlan, postmaster, Houston, Tex.	do	2 00
6	A. C. Chase, postmaster, Syracuse, N. Y.	do	77 75
6	P. J. Popple, postmaster, Dunkirk, N. Y.	do	27 50
6	C. W. Goddard, postmaster, Portland, Me.	do	25 00
May 8	M. Piggott, postmaster, Quincy, Ill.	do	13 00
8	N. B. Sherwin, postmaster, Cleveland, Ohio.	do	105 25
31	George Parker, postmaster, Poughkeepsie, N. Y.	For items of miscellaneous expenses disallowed in returns for first quarter, 1879.	30 00
June 13	V. C. Thompson, postmaster, Louisville, Ky.	For additional allowance of miscellaneous expenses, third quarter, 1878.	29 11
13	W. W. Forbes, postmaster, Richmond, Va.	For amount paid outside watchman for fourth quarter, 1878.	11 00
July 3	F. W. Palmer, postmaster, Chicago, Ill.	For amount expended on account of railway mail service and special agents in second quarter, 1879.	520 00
7	T. L. Jamea, postmaster, New York, N. Y.	For expenditures on account of railway mail service, second quarter, 1879.	105 00
10	T. F. Robley, postmaster, Fort Scott, Kan.	do	37 50
10	P. J. Popple, postmaster, Dunkirk, N. Y.	do	37 50
10	A. D. Rodgers, postmaster, Columbus, Ohio.	do	14 25
10	W. H. Denny, postmaster, Vincennes, Ind.	do	0 00
10	N. B. Sherwin, postmaster, Cleveland, Ohio.	do	100 00

No. 5.—Statement in detail of miscellaneous payments, &c.—Continued.

AMOUNTS CREDITED POSTMASTERS ON THEIR GENERAL ACCOUNTS—Continued.

Date.	To whom allowed.	For what object.	Amount.
1879.			
July 10	J. Richardson, postmaster, Houston, Tex.	For expenditures on account of railway mail service, second quarter, 1879.	\$40 00
15	J. P. Woolfolk, postmaster, Jackson, Tenn.	.....do.....	35 00
15	T. S. Case, postmaster, Kansas City, Mo.	.....do.....	200 00
15	Samuel Hays, postmaster, Saint Louis, Mo.	.....do.....	85 70
15	C. H. Eddy, postmaster, Toledo, Ohio.	.....do.....	30 00
15	Benjamin Conley, postmaster, Atlanta, Ga.	.....do.....	74 00
15	.....do.....	For expenditures on account of special agents Post-Office Department, second quarter, 1879.	68 55
15	E. S. Tobey, postmaster, Boston, Mass.	For expenditures on account of railway mail service, second quarter, 1879.	42 22
15	C. W. Goddard, postmaster, Portland, Me.	.....do.....	37 50
15	C. S. Sage, postmaster, Williams-town, N. Y.	For amount paid for telegraphing in first quarter, 1879.	1 60
17	A. D. H. Thompson, postmaster, Memphis, Tenn.	For expenditures on account of railway mail service, second quarter, 1879.	22 50
26	J. P. Loge, postmaster, Cincinnati, Ohio.	.....do.....	342 75
26	A. C. Chase, postmaster, Syracuse, N. Y.	.....do.....	56 25
28	J. F. Wilson, postmaster, Lynchburg, Va.	.....do.....	25 00
28	V. C. Thompson, postmaster, Louisville, Ky.	.....do.....	9 63
31	William Rule, postmaster, Knoxville, Tenn.	.....do.....	30 00
Aug. 12	W. H. Mitchell, postmaster, Beloit, Kans.	For amount paid for telegraphing in second quarter, 1879.	2 01
15	J. T. Wilder, postmaster, Chattanooga, Tenn.	For expenditures on account of railway mail service, second quarter, 1879.	123 68
23	A. H. Tuttle, postmaster, Rutland, Vt.	For amount paid for repairs of office in second quarter, 1879.	10 15
29	D. T. Hunt, postmaster, Rochester, N. Y.	For miscellaneous items disallowed in returns for second quarter, 1879.	15 45
Sept. 3	E. C. Sumner, postmaster, Denver, Colo.	For miscellaneous expenditures in second quarter, 1879.	16 00
17	Benjamin Conley, postmaster, Atlanta, Ga.	For expenditures on account of railway mail service, second quarter, 1879.	75 00
			\$10,914 81

RECAPITULATION.

Amounts allowed to the postmasters at the principal offices of the United States, credited in quarterly accounts current, for incidental expenses of such offices actually and necessarily incurred, such as office repairs, gas fixtures, telegrams, and other miscellaneous expenses, and charged to "Miscellaneous" account, office of the First Assistant Postmaster-General.

Third quarter, 1878	\$14,624 45
Fourth quarter, 1878	16,095 18
First quarter, 1879	16,713 33
Second quarter, 1879	9,804 01
Total	57,036 95
Amount allowed postmasters and others, credited on general accounts	\$10,914 81
Amount paid by warrant	5,820 49
Amount paid by draft	2,511 82
	19,247 12
Total	76,284 07
Deduct amount charged to postmasters for overcredits	\$240 25
Deduct amount of fares charged to inland transportation	46 50
	286 75
Amount actually paid and charged to "Miscellaneous" account.	\$75,997 32

J. M. MCGREW, Auditor.

OFFICE OF THE AUDITOR OF THE TREASURY
FOR THE POST-OFFICE DEPARTMENT, October 29, 1879.

No. 6.—*Statement in detail of miscellaneous payments made by the Post-Office Department for the fiscal year ended June 30, 1879, and charged to "Miscellaneous, Postmaster-General."*

AMOUNT PAID BY WARRANTS.

Date.	To whom paid.	For what object.	Amount.
1878.			
Aug. 22	E. L. Godkin, New York....	For one year's subscription to the Nation	\$5 20
Sept. 5	Annie F. Craig, New York..	For one copy of the American Mechanical Dictionary for the Post-Office Department.	27 00
21	A. H. Bissell, law clerk, Post-Office Department:	For personal expenses while traveling under orders of the Postmaster-General.	7 21
Oct. 9	John C. Parker, Washington, D. C.	For three copies of the New York Tribune from July 1 to September 30, 1878, for Post-Office Department.	11 25
Nov. 11	C. V. Riley, Washington, D. C.	For five copies of Rand & Nally's Business Atlas....	45 00
11	R. C. Morgan, disbursing officer of State Department.	For five copies of new edition of the Revised Statutes of the United States.	14 50
13	James Anglim, Washington, D. C.	For one copy of Powers's Political Register	6 00
Dec. 4	C. V. Riley, Washington, D. C.	For one Business Atlas	9 00
4	R. C. Morgan, disbursing officer of State Department.	For seven copies of the Revised Statutes of the United States.	20 30
10	F. Leyboldt, publisher	For subscription to volume 3 of the Library Journal	5 00
1879.			
Jan. 24	T. B. Kirby	For one copy of speeches of John Sherman for library of Post-Office Department.	2 50
24	John C. Parker, Washington, D. C.	For three copies of the New York Tribune from October 1 to December 31, 1878.	11 85
Feb. 7	E. H. Talbot, Chicago, Ill.	For one year's subscription to the Railway Age ...	4 00
12	J. O. P. Burnside, disbursing clerk, Post-Office Department.	For amount paid for street-car tickets for use of Post-Office Department.	12 00
26	John W. Forney, publisher	For one year's subscription to Progress	5 00
Mar. 7	James J. Chapman	For stationery furnished to the Post-Office Department.	12 50
10	.....do	For one American Almanac	1 50
Apr. 3	George C. Maynard	For one electric pen	25 00
3	O. H. Irish, Chief of Bureau of Engraving and Printing.	For engraving seals for the Post-Office Department	20 00
3	William Van Vleck	For Postal Guides for use of the Department	4 80
26	A. H. Barnes & Co., publishers.	For one year's subscription to International Review.	5 00
May 3	Houghton, Osgood & Co., publishers.	For forty copies of Postal Guide	11 50
June 28	J. O. P. Burnside, disbursing clerk, Post-Office Department.	For amount paid for street-car tickets for use of Post-Office Department.	27 00
30	J. C. Parker, Washington, D. C.	For four copies of the New York Tribune from April 1 to June 30, 1879.	15 00
July 8	Robert Beall	For London Directory and Guide	21 35
16	J. O. P. Burnside, disbursing clerk, Post-Office Department.	For amount paid for street-car tickets for use of Post-Office Department.	161 24
	Total paid by warrant		\$490 80

AMOUNTS PAID BY DRAFT.

1878.			
July 23	A. H. Bissell, law clerk, Post-Office Department.	For personal expenses while traveling under orders of Postmaster-General.	\$150 00
Oct. 12	J. H. Marr, chief clerk to First Assistant Postmaster-General.	For personal expenses while traveling on business of the Post-Office Department.	50 00
1879.			
Jan. 25	James N. Tyner, First Assistant Postmaster-General.	For personal expenses to New York on business of the Post-Office Department.	23 78
Feb. 2	George Herbert	For one copy of London Weekly Times from January 1, 1879.	5 00
28	The estate of George P. Gordon.	For one printing-press for the use of the Post-Office Department.	239 50
28	William M. Stuart, New York.	For putting up printing-press and furnishing material.	44 75
Mar. 25	G. H. Bier	For one copy of Principles and Acts of the Revolution.	3 00

No. 6.—Statement in detail of miscellaneous payments made, &c.—Continued.

Date.	To whom paid.	For what object.	Amount.
1879.			
May 7	A. H. Thompson	For one copy of Through the Dark Continent.....	\$12 00
Sept. 8	A. S. Och	For the Chattanooga Daily Times for fiscal year 1879.	8 00
Total paid by draft			\$635 95

AMOUNTS CREDITED ON GENERAL ACCOUNT.

1879.			
Aug. 2	W. A. Knapp, chief clerk, Post-Office Department.	For personal expenses while traveling on business for Post-Office Department.	\$247 60
5	A. H. Bissell, law clerk, Post-Office Department.	For personal expenses while traveling on business for Post-Office Department.	78 47
Total credited on general account			\$326 07
Total paid by warrant			490 80
Total paid by draft			635 95
Total miscellaneous, Postmaster-General			\$1,452 82

OCTOBER 29, 1879.

J. M. MCGREW, Auditor.

No. 7.—Statement showing the condition of the account, with each item of the appropriation, for the service of the Post-Office Department for the fiscal year ended June 30, 1879.

Title of appropriations.	Amount, including special acts and deficiencies.	Expended.	Balance unexpended.	Excess of expenditures.
Compensation of postmasters	\$7,250,000 00	\$7,182,239 27	\$67,760 73	.....
Compensation of clerks for post-offices	3,465,000 00	3,413,295 90	51,704 10	.....
Compensation of letter-carriers and incidental expenses	1,946,000 00	1,947,706 61	.....	\$1,706 61
Wrapping-paper	20,000 00	18,877 71	1,122 29	.....
Twine	45,000 00	45,375 89	.....	375 89
Post-marking and canceling stamps	12,000 00	11,997 45	2 55	.....
Letter-balances	3,500 00	3,501 25	.....	1 25
Rent, light, and fuel for post-offices	380,000 00	364,083 87	15,906 13	.....
Stationery	50,000 00	43,420 56	6,579 44	.....
Furniture for post-offices	20,000 00	11,375 51	8,624 49	.....
Miscellaneous, office of First Assistant Postmaster-General	80,000 00	75,890 51	4,109 49	.....
Inland mail transportation, railroad	9,550,000 00	9,100,706 67	449,293 33	.....
Inland mail transportation, star	5,390,673 00	5,537,245 28	.....	146,572 28
Inland mail transportation, steamboat	700,000 00	665,107 84	34,892 16	.....
Compensation of railway post-office clerks	1,342,000 00	1,341,394 14	605 86	.....
Compensation of route-agents	1,036,500 00	1,035,861 91	638 09	.....
Compensation of mail-route messengers	171,000 00	171,241 32	.....	241 32
Compensation of local agents	116,500 00	116,177 88	322 12	.....
Compensation of mail-messengers	675,000 00	656,874 04	18,125 96	.....
Mail-boxes and keys	15,000 00	13,180 55	1,819 45	.....
Mail-bags and catchers	185,000 00	150,614 86	34,385 14	.....
Post-route maps, including sales	41,097 75	41,097 23	52	.....
Mail depredations and special agents, including fees and rewards	150,000 00	145,122 64	4,877 36	.....
Postage-stamps	80,000 00	78,534 88	1,465 12	.....
Distribution of postage-stamps	8,100 00	7,503 54	596 46	.....
Stamped envelopes and newspaper-wrappers	470,000 00	402,152 64	67,847 36	.....
Distribution of stamped envelopes and newspaper-wrappers	16,000 00	15,259 37	740 63	.....
Postal cards	170,000 00	154,281 96	15,718 04	.....
Distribution of postal cards	6,100 00	5,713 55	386 45	.....
Registered-package envelopes, locks, and seals	40,000 00	18,259 83	21,740 17	.....
Official and dead-letter envelopes	25,000 00	22,792 80	.....	4,792 80
Ship, steamboat, and way letters	6,000 00	1,820 43	4,179 57	.....
Engraving, printing, and binding drafts and warrants	1,500 00	960 60	539 40	.....
Advertising	60,000 00	25,354 25	34,645 75	.....
Miscellaneous, office of Postmaster-General	1,500 00	1,452 82	47 18	.....
Foreign mail transportation	240,000 00	203,917 03	36,082 97	.....
Balances due foreign countries	40,000 00	31,832 72	8,167 28	.....
Laws and regulations Post-Office Department	20,000 00	18,202 51	1,797 49	.....
Total	33,828,470 75	33,073,437 82	908,723 08	153,690 15

No. 8.—Table showing the receipts, expenditures, and net revenue of the post-offices at which the free-delivery system is in operation for the fiscal year ended June 30, 1879.

State.	Office.	Gross revenue.	Office expenses.	Free delivery.	Total expenses.	Net revenue.
Maine	Bangor	\$22,111 03	\$8,463 14	\$3,127 58	\$11,590 72	\$10,520 31
	Portland	78,689 29	21,227 26	7,718 25	28,945 51	49,743 78
New Hampshire	Manchester	23,277 60	5,568 07	3,841 08	10,409 15	12,868 45
Massachusetts	Boston	1,028,664 62	230,773 70	139,256 84	370,030 54	658,634 08
	Fall River	22,514 50	9,100 62	3,184 79	12,285 41	10,229 09
	Lawrence	22,652 80	7,246 12	6,302 49	13,548 61	19,404 19
	Lowell	48,832 19	9,743 02	7,516 85	17,259 87	31,572 32
	Lynn	20,178 30	6,503 20	5,714 11	12,209 31	16,669 99
	New Bedford	27,657 88	5,928 59	5,580 30	11,508 89	16,148 99
	Salem	20,576 85	5,818 22	4,419 47	10,237 69	10,339 16
	Springfield	58,580 00	11,076 89	6,031 11	17,108 00	39,472 00
	Worcester	68,364 14	11,649 83	8,639 28	20,289 11	48,074 03
Rhode Island	Providence	127,185 24	21,445 27	18,133 07	39,578 34	87,606 90
Connecticut	Hartford	96,595 00	20,875 06	8,028 23	28,903 29	67,691 71
	New Haven	82,441 28	16,699 47	11,772 45	28,471 92	53,969 36
New York	Albany	125,097 35	35,973 26	20,585 66	56,558 92	68,438 43
	Brooklyn	401,874 15	52,933 40	77,470 11	130,403 51	271,470 64
	Buffalo	161,882 47	29,993 28	30,036 74	60,030 02	101,852 45
	Elmira	28,128 28	9,129 92	4,069 64	14,099 56	14,028 72
	New York	2,994,295 91	813,121 24	352,233 55	1,165,354 79	1,828,941 12
	Oswego	17,358 07	7,038 13	4,646 87	11,685 00	5,673 07
	Poughkeepsie	32,387 50	9,283 83	4,618 70	13,902 53	18,484 97
	Rochester	122,240 88	22,576 64	17,263 42	39,840 06	82,400 82
	Syracuse	74,275 50	16,325 05	11,829 64	28,154 69	46,120 81
	Troy	69,894 81	16,634 69	11,433 81	28,068 50	41,826 31
	Utica	49,468 67	10,679 25	9,468 55	20,147 80	29,320 87
New Jersey	Camden	15,782 63	5,789 41	4,046 15	10,435 56	5,347 07
	Elizabeth	28,719 19	6,498 61	4,734 64	11,233 25	17,485 94
	Hoboken	10,040 14	3,798 99	2,958 24	6,755 23	3,284 91
	Jersey City	41,011 82	8,064 31	12,588 37	20,652 68	20,359 14
	Newark	91,925 55	12,797 84	20,216 24	33,014 08	58,911 47
	Paterson	20,329 40	5,844 40	5,651 78	11,496 18	9,833 22
	Trenton	36,464 02	7,953 70	4,297 32	12,251 02	24,213 00
Pennsylvania	Allentown	23,121 65	7,137 99	8,306 56	15,444 55	7,677 10
	Easton	15,107 90	6,156 80	4,582 92	10,739 72	4,368 18
	Erie	26,010 58	8,988 62	5,563 61	14,552 23	11,458 35
	Harrisburgh	57,977 98	15,509 53	4,498 07	20,007 60	37,970 38
	Lancaster	25,607 45	5,547 04	3,809 02	10,356 06	15,251 39
	Philadelphia	1,057,567 08	107,645 64	223,954 18	421,598 82	635,968 26
	Pittsburgh	214,421 77	47,476 02	20,282 36	76,758 38	137,663 39
	Reading	26,373 04	7,423 89	6,228 14	13,651 03	12,721 01
	Pottsville	11,841 15	5,267 21	3,079 84	8,347 05	3,494 10
Delaware	Wilmington	32,903 04	8,163 76	7,575 10	15,738 86	17,164 18
Maryland	Baltimore	364,049 67	71,263 40	57,071 46	128,333 86	235,714 81
Dist. Columbia	Washington	191,591 32	98,106 50	36,449 10	134,555 60	57,035 72
Virginia	Norfolk	33,245 16	9,066 67	8,621 52	17,688 19	15,556 97
	Petersburgh	19,519 84	6,943 18	3,886 14	10,829 32	8,690 52
	Richmond	77,612 55	18,569 34	12,063 83	30,633 17	46,979 38
West Virginia	Wheeling	31,762 58	10,722 06	6,684 02	15,406 08	16,356 50
South Carolina	Charleston	56,141 77	11,737 66	6,057 97	17,795 63	38,346 14
Georgia	Atlanta	47,959 23	13,773 65	4,584 14	18,357 79	29,601 44
	Savannah	44,314 61	15,799 35	4,491 78	20,291 13	24,023 48
Alabama	Mobile	38,173 18	14,409 96	4,004 14	18,414 10	19,759 08
Louisiana	New Orleans	195,564 04	63,480 96	39,520 29	102,001 25	127,562 79
Tennessee	Memphis	54,912 82	19,950 88	9,839 78	29,790 64	25,122 18
	Nashville	62,012 31	18,330 08	7,613 10	25,943 18	36,069 13
Kentucky	Covington	14,033 12	5,993 48	3,616 76	9,610 24	4,422 88
	Louisville	158,689 48	30,342 37	26,809 19	56,951 58	101,737 90
Ohio	Cincinnati	447,753 52	91,649 29	62,732 41	154,381 70	293,371 82
	Cleveland	199,565 06	36,786 56	30,603 62	67,390 18	132,174 88
	Columbus	75,517 92	16,983 09	9,583 36	26,566 75	48,951 17
	Dayton	49,036 28	13,280 09	9,253 33	22,535 42	26,500 86
	Toledo	92,642 31	14,924 91	11,507 91	26,432 82	66,209 49
Indiana	Evansville	28,407 26	9,915 80	5,592 07	15,507 87	12,899 39
	Fort Wayne	27,195 54	9,724 09	5,445 00	15,169 09	12,026 45
	Indianapolis	119,315 00	31,730 34	23,664 92	55,395 26	63,919 74
	La Fayette	20,594 68	8,845 79	3,648 95	12,494 74	8,099 94
Illinois	Bloomington	24,480 92	8,305 28	4,611 54	12,916 80	11,564 12
	Chicago	1,089,308 43	316,362 68	137,000 07	453,362 75	635,945 68
	Peoria	41,029 43	10,104 03	6,353 74	16,457 77	24,571 66
	Quincy	31,046 28	10,251 78	6,589 79	15,841 57	15,204 71
	Springfield	28,857 76	8,297 13	3,889 99	12,187 12	16,670 64
Michigan	Detroit	196,068 00	35,812 91	27,246 08	63,058 07	132,907 93
	Grand Rapids	46,173 28	10,943 21	6,192 36	17,135 57	29,037 71
Wisconsin	Milwaukee	157,821 04	20,319 26	23,836 58	50,153 84	107,667 20
Minnesota	Minneapolis	56,654 57	15,617 09	8,163 55	23,780 64	32,873 93
	Saint Paul	70,662 50	15,095 41	7,513 10	22,608 51	48,054 00
Iowa	Burlington	32,378 24	7,005 65	4,457 44	11,463 09	20,915 15
	Davenport	29,353 53	8,864 43	5,937 82	14,802 25	14,551 28

No. 8.—Table showing the receipts, expenditures, and net revenue, &c.—Continued.

State.	Office.	Gross revenue.	Office expenses.	Free delivery.	Total expenses.	Net revenue.
Iowa.....	Des Moines.....	\$41,432 05	\$9,675 00	\$5,486 04	\$15,161 04	\$26,271 01
	Dubuque.....	31,177 14	7,676 85	3,714 15	11,391 00	19,786 14
Missouri.....	Kansas City.....	86,631 86	18,526 71	8,895 19	27,421 90	59,209 96
	Saint Joseph.....	41,663 46	11,931 98	5,225 27	17,157 25	24,506 21
	Saint Louis.....	514,214 19	123,628 74	95,056 14	218,684 88	295,529 31
Nebraska.....	Omaha.....	47,348 15	13,608 12	4,604 19	18,212 31	29,135 84
Kansas.....	Leavenworth.....	24,062 17	8,271 00	3,678 75	11,949 75	12,112 42
California.....	Oakland.....	30,487 82	11,094 92	3,272 01	14,366 93	16,120 89
	San Francisco ..	427,492 90	88,407 59	49,313 50	137,721 09	289,771 81
Total.....	.....	13,066,470 76	3,191,393 44	1,942,264 20	5,133,657 64	7,932,813 12

OCTOBER 30, 1879.

J. M. MCGREW, Auditor.

No. 9.—Statement showing the transactions of the Money-Order Office

States and Territories.	Domestic.					
	Balance due the United States from last year.	Number of orders issued.	Amount of orders issued.	Fees.	Premium.	Drafts and deposits received from postmasters.
Alabama	\$15,702 29	91,173	\$1,447,983 41	\$12,099 55	83 96	\$701,129 21
Arizona	24,347 15	14,842	487,404 19	2,803 05		11,889 00
Arkansas	19,286 14	74,992	1,480,812 91	10,869 30		901,457 80
California	25,899 09	141,208	2,350,936 81	19,248 30	1 42	1,938,730 30
Colorado	15,949 09	78,988	1,391,880 49	10,746 80		797,518 00
Connecticut	6,468 82	89,124	1,070,794 41	10,664 75		337,285 00
Dakota	8,691 27	26,686	496,204 90	3,732 40		28,950 00
Delaware	1,621 48	12,139	140,524 79	1,434 15		5,675 00
District of Columbia	6,756 57	34,858	552,234 81	4,536 25	85 00	998,019 23
Florida	21,860 06	42,810	798,567 70	6,122 90		98,222 00
Georgia	52,698 62	116,734	1,674,166 87	14,817 10		1,458,815 00
Idaho	1,665 30	11,542	216,195 88	1,975 10	85	87,267 00
Illinois	92,754 78	609,501	7,527,636 93	73,501 15	103 40	7,642,196 86
Indiana	29,803 51	303,038	3,537,229 61	35,994 35	31 60	1,370,347 46
Indian Territory	1,017 94	3,447	74,172 92	526 80		
Iowa	48,550 99	418,473	4,888,319 08	49,944 45		2,268,944 25
Kansas	33,440 81	280,600	4,065,563 23	34,284 40	2 15	1,413,558 77
Kentucky	11,642 56	104,392	1,378,670 97	12,945 65		1,013,329 00
Louisiana	63,966 73	67,293	1,482,749 96	10,225 25		2,237,430 00
Maine	16,293 52	83,655	1,280,684 05	10,737 25	17	728,456 00
Maryland	7,470 97	65,427	896,227 54	8,145 90	33	1,032,659 12
Massachusetts	23,654 57	200,829	2,726,716 36	24,817 45	11 73	1,799,098 00
Michigan	46,972 74	321,455	4,083,967 41	39,239 30	19 22	2,019,431 00
Minnesota	26,173 54	163,549	2,018,988 48	18,981 63	6 64	1,130,248 00
Mississippi	29,635 99	96,252	1,500,170 95	12,719 75	3 13	38,750 00
Missouri	44,181 79	260,374	3,537,962 17	32,422 90	41	6,263,968 53
Montana	10,406 23	16,024	306,138 52	2,307 45		210,498 00
Nebraska	25,769 71	116,739	1,720,826 87	14,830 15		1,468,223 87
Nevada	6,890 96	35,904	768,461 79	5,423 25		238 00
New Hampshire	4,932 30	54,598	673,619 67	6,564 25		62,690 00
New Jersey	5,944 58	75,012	960,626 34	9,136 25	25	252,260 00
New Mexico	6,926 63	6,984	139,427 35	1,019 75		106,144 56
New York	106,982 48	458,216	6,087,417 53	57,276 85	123 88	18,844,196 76
North Carolina	18,617 70	90,485	1,394,157 13	11,850 55		208,297 00
Ohio	43,627 37	463,791	5,231,881 03	54,518 20	44 70	3,470,402 15
Oregon	28,142 57	42,154	827,709 20	6,210 20		732,641 83
Pennsylvania	40,423 75	340,763	4,036,817 00	40,621 15	1 83	2,984,901 40
Rhode Island	1,926 28	29,000	388,493 10	3,569 10		84,827 00
South Carolina	10,359 79	67,909	983,216 91	8,631 70		540,763 20
Tennessee	31,771 63	115,536	1,902,876 41	15,497 45		1,546,408 12
Texas	63,785 22	252,520	4,680,082 78	34,189 40	34 14	3,140,129 11
Utah	7,059 33	14,280	268,583 30	2,027 45		216,967 00
Vermont	7,093 22	52,424	593,067 17	6,098 75		102,930 00
Virginia	15,315 68	90,056	1,183,643 65	11,225 05	221 70	1,228,162 14
Washington	3,564 93	17,674	387,796 97	2,731 70		1,089 60
West Virginia	3,683 14	35,067	436,872 75	4,350 45		48,215 00
Wisconsin	47,128 90	288,813	3,850,624 53	34,993 55		2,060,467 00
Wyoming	3,938 95	15,013	248,473 99	2,017 10	25 68	
Total	1,170,806 67	6,372,243	88,264,541 02	798 625 65	721 44	78,569,456 14

of the United States during the fiscal year ended June 30, 1879.

Domestic.	International.								
Transfers from postage fund.	Canadian.			British.			German.		
	Number of orders issued.	Amount of orders issued.	Fees.	Number of orders issued.	Amount of orders issued.	Fees.	Number of orders issued.	Amount of orders issued.	Fees.
\$7,361 00	15	\$157 55	\$4 20	83	\$1,578 10	\$45 75	274	\$6,742 61	\$182 15
76 00	19	758 55	15 60	78	2,476 50	65 00	45	1,579 20	41 00
244 51	16	410 75	8 80	76	829 55	42 25	105	1,659 85	45 20
7,973 06	956	23,657 87	512 20	3,072	53,745 35	1,550 25	2,726	63,473 28	1,676 50
3,653 91	177	4,773 45	103 00	3,447	70,349 85	1,958 75	242	5,299 85	142 75
14,529 50	233	3,626 17	87 40	2,155	26,172 81	844 00	674	11,622 71	319 50
821 38	10	217 60	5 00	168	4,203 14	115 50	55	1,270 50	34 75
6,387 00	41	849 93	19 20	125	2,015 15	60 00	53	1,388 95	38 45
4,186 33	130	2,432 41	57 80	502	7,028 76	226 50	401	7,243 17	199 65
2,200 89	99	3,002 80	64 00	173	4,445 77	120 25	93	2,158 50	57 05
18 46	270	8,316 02	174 40	270	5,388 20	153 75	442	11,905 05	319 00
62,583 57	57	2,572 00	51 80	123	3,654 61	97 00	42	1,527 00	38 80
9,082 03	986	15,348 25	361 80	4,864	68,509 37	2,115 50	5,803	97,529 29	2,758 15
85 00	128	1,539 39	89 40	824	11,135 70	346 50	975	12,636 03	360 00
23,816 18	114	2,044 52	49 20	665	8,950 35	279 75	755	12,166 82	338 40
19,717 00	58	1,012 75	23 80	350	5,512 76	165 75	193	3,056 27	85 35
9,381 45	100	1,346 35	34 60	411	5,546 48	168 25	445	7,328 90	203 80
150 00	139	3,197 55	69 20	820	7,458 93	207 00	493	10,242 88	273 90
11,510 30	288	5,089 78	120 60	568	8,476 98	236 75	40	641 60	17 65
4,626 00	151	4,064 60	89 60	741	10,043 73	317 00	1,227	21,189 94	581 45
50,353 79	3,024	55,766 50	1,287 80	6,131	74,184 04	2,396 25	1,369	26,779 60	726 25
14,070 23	2,164	42,473 57	970 40	2,655	35,460 12	1,110 50	1,257	18,719 61	532 75
30,625 37	250	4,919 59	111 00	344	4,606 02	143 00	531	6,241 19	183 80
3,341 38	7	165 00	3 80	47	725 34	22 00	21	278 75	7 90
30,128 26	274	4,983 59	111 60	1,144	17,927 21	532 50	1,400	24,015 34	664 75
23,337 00	39	1,476 65	30 40	149	4,007 52	107 75	45	1,291 50	34 15
5,164 72	46	796 10	19 20	223	3,463 68	113 75	271	4,973 60	134 70
26,939 34	205	5,671 61	120 60	466	8,381 90	239 00	123	3,420 50	89 20
100,391 58	227	3,874 88	90 80	476	6,342 92	199 00	96	1,864 95	50 25
1,442 79	243	4,803 01	100 00	3,415	40,285 72	1,319 75	1,722	25,800 28	718 20
79,810 49	3	19 00	80	2	48 00	1 25	23	1,033 85	26 65
638 21	3,090	56,137 89	1,308 00	15,766	204,461 89	6,478 75	15,673	261,793 20	7,307 70
47,430 04	44	792 37	18 60	77	1,175 74	36 75	258	8,442 23	219 05
79 00	609	8,577 40	210 60	8,148	39,360 77	1,257 75	2,771	43,862 95	1,219 35
215 59	105	2,794 37	60 00	244	4,202 32	119 75	302	7,016 00	183 90
10,418 13	723	13,268 43	307 60	6,116	72,105 94	2,368 75	2,530	42,286 48	1,163 65
11,899 39	296	5,236 93	122 40	1,612	21,624 71	667 75	180	2,485 89	71 25
9,232 31	13	306 24	6 60	59	1,067 75	30 50	284	9,605 12	246 05
5,341 23	85	688 25	16 00	267	4,197 36	125 75	192	4,149 15	113 45
355 85	68	964 07	23 20	442	8,719 43	250 25	1,010	20,832 60	559 40
7,090 14	16	441 00	9 60	699	8,685 08	281 50	39	790 25	21 20
11 27	118	1,486 06	37 80	235	2,870 26	91 75	7	66 00	2 60
	129	2,376 58	53 40	385	6,633 82	197 25	324	7,762 69	205 45
	124	4,141 50	87 00	111	2,354 75	65 50	98	3,056 50	78 00
	4	28 10	80	119	1,761 42	55 00	108	1,524 90	43 30
	434	9,878 50	212 20	833	10,023 51	329 25	1,622	20,762 33	603 60
	14	259 50	6 00	190	2,659 94	73 50	28	650 50	17 45
654,229 71	16,231	316,283 98	7,217 80	64,810	894,859 25	27,753 00	47,342	829,788 36	22,927 00

No. 9.—Statement showing the transactions of the Money-Order Office of the

States and Territories.	International—Continued.						Balance due postmaster, &c.
	Swiss.			Italian.			
	Number of orders issued.	Amount of orders issued.	Fcs.	Number of orders issued.	Amount of orders issued.	Fcs.	
Alabama.....	2	\$54 00	\$1 50	14	\$385 00	\$10 00	\$63 05
Arizona.....							
Arkansas.....	1	10 00	25	12	273 75	7 75	69 35
California.....	279	5,530 70	149 50	412	11,921 20	311 25	251 92
Colorado.....	19	398 40	10 75	48	1,658 25	42 75	73 52
Connecticut.....	23	530 10	14 75	46	824 70	23 00	44 20
Dakota.....							37 12
Delaware.....	2	39 00	1 00	3	69 00	2 00	
District of Columbia.....	65	913 61	28 25	62	1,348 16	36 25	
Florida.....	3	105 00	2 75	6	176 35	5 00	8 65
Georgia.....	25	493 00	14 25	26	953 30	24 75	91 57
Idaho.....							87 84
Illinois.....	727	12,031 72	353 50	612	16,933 75	445 75	861 93
Indiana.....	53	853 75	25 75	24	538 50	14 50	86 15
Indian Territory.....							
Iowa.....	53	988 25	28 75	10	168 00	4 50	502 49
Kansas.....	10	172 80	4 75	3	50 00	1 25	1,342 83
Kentucky.....	26	558 40	15 50	49	1,154 00	31 00	105 63
Louisiana.....	28	697 00	18 25	568	13,791 95	372 75	
Maine.....	4	112 00	3 00	21	389 50	11 50	22 75
Maryland.....	52	1,283 33	35 25	81	1,478 80	42 00	12 41
Massachusetts.....	82	1,523 33	42 50	427	9,440 44	260 00	278 92
Michigan.....	164	1,919 85	65 00	29	661 01	18 75	183 67
Minnesota.....	54	1,720 50	45 25	2	100 00	2 50	160 44
Mississippi.....	13	483 00	12 25	29	936 50	24 75	85 69
Missouri.....	206	4,263 95	119 75	203	5,740 40	150 75	206 30
Montana.....							
Nebraska.....	1	10 00	25	8	156 00	4 25	34 36
Nevada.....	17	490 00	12 25	17	643 00	16 50	
New Hampshire.....	12	349 75	9 25	3	50 10	1 50	149 40
New Jersey.....	50	776 95	23 75	9	74 86	2 75	208 35
New Mexico.....							
New York.....	2,384	44,588 80	1,277 50	371	7,702 67	213 00	395 14
North Carolina.....	4	45 00	1 25	1	5 00	25	36 73
Ohio.....	249	4,525 04	130 50	146	4,251 25	111 00	748 12
Oregon.....	21	634 25	16 50	4	114 00	3 25	
Pennsylvania.....	190	3,030 00	93 00	619	16,544 10	433 50	246 63
Rhode Island.....	8	131 58	4 25	20	424 40	11 25	1 61
South Carolina.....				1	1 75	25	104 35
Tennessee.....	94	2,042 65	57 25	37	727 65	20 50	68 89
Texas.....	28	576 50	15 50	71	1,777 55	48 00	116 20
Utah.....	26	708 35	19 00	3	19 00	75	
Vermont.....							732 44
Virginia.....	11	295 75	8 00	34	871 97	24 00	106 44
Washington.....							
West Virginia.....	3	20 00	75	8	182 00	5 00	22 87
Wisconsin.....	196	3,258 94	98 00	25	708 25	18 75	186 96
Wyoming.....				6	197 00	3 00	
Total.....	5,135	96,171 25	2,758 50	4,070	103,352 11	2,760 25	7,783 32

United States during the fiscal year ended June 30, 1879.—Continued.

Domestic.					International.		
Number of orders paid.	Amount of orders paid.	Amount of orders repaid.	Transferred to postage fund.	Deposits.	Canadian.		
					Number of orders paid.	Amount of orders paid.	Amount of orders repaid.
38,323	\$661,554 46	\$9,935 97	\$4,958 00	\$1,486,911 50	23	\$657 62	.....
4,798	184,696 23	4,115 04		326,468 00	5	150 19	.....
29,335	650,098 63	9,463 14	59,746 00	1,729,995 30	43	890 70	.....
99,949	2,191,925 87	15,935 54		2,108,910 41	984	23,054 61	\$35 00
40,419	827,204 29	11,933 81	564 14	1,417,681 00	119	3,234 97	.....
65,372	982,420 58	6,291 15		472,125 00	279	4,499 18	.....
8,315	197,431 27	4,213 71	142 08	326,180 05	22	693 69	.....
7,285	103,584 63	672 37	55 00	51,672 00	38	800 49	.....
45,906	621,952 92	4,902 01		928,281 00	105	1,886 83	.....
18,666	384,158 16	3,940 34	3,600 00	522,030 24	35	755 22	.....
86,051	1,370,718 68	10,026 45	3,920 84	1,782,040 95	19	574 64	20 00
1,826	61,752 87	1,043 08	219,227 00	127,477 00			
826,823	9,884,297 48	49,214 12	1,905 86	5,395,955 77	1,055	16,724 05	99 32
182,667	2,508,364 80	21,994 95	352 52	2,398,679 46	143	2,702 13	.....
306	6,112 94	758 80		67,646 12			
266,638	3,896,001 37	30,936 82	1,327 07	3,248,279 25	205	4,785 89	1 35
155,602	3,076,504 88	32,483 25	143 26	2,380,671 09	145	4,112 39	.....
114,278	1,671,906 26	10,061 45	9 42	724,738 00	90	1,159 93	.....
82,709	1,445,606 80	8,205 58		2,271,721 23	100	1,303 40	.....
105,454	1,337,930 43	5,467 86	350 00	648,413 00	1,333	19,806 56	86 00
99,875	1,647,456 17	5,336 80	40 00	303,759 08	146	2,447 58	.....
458,127	3,849,521 53	15,495 54	649 79	761,934 00	3,580	58,720 21	74 05
229,459	3,242,043 10	27,052 06	413 71	2,884,428 00	1,586	32,133 07	122 75
95,637	1,551,938 77	14,970 22	268 35	1,594,919 80	423	11,194 98	10 00
28,823	487,641 20	9,762 25	845 00	1,048,878 31	6	94 51	.....
371,815	6,249,566 22	22,524 29	16,517 34	3,551,651 07	204	4,355 42	9 00
3,667	91,768 30	2,955 64		421,758 00	5	85 09	.....
64,533	1,241,091 23	12,915 61	48 00	1,943,170 76	96	2,310 72	.....
5,281	129,121 89	5,357 73		649,484 00	79	2,641 43	.....
38,084	508,074 74	3,104 15	40 00	239,215 00	143	2,696 56	51 00
64,671	994,577 43	5,291 27	780 00	269,933 00	352	5,285 22	3 50
1,358	36,526 03	882 74		207,620 21	2	46 17	.....
1,124,518	12,218,588 16	45,276 61	241,561 85	12,758,444 58	6,433	79,845 78	243 98
36,122	599,435 44	8,569 75	4,097 55	1,001,313 30	7	139 05	.....
524,600	6,295,681 21	32,337 52	83,411 98	2,414,058 20	776	11,009 28	46 00
19,463	521,758 13	6,202 23		1,009,025 41	173	4,139 37	.....
412,628	4,873,948 90	25,450 17	6,914 23	2,095,717 37	1,187	16,401 54	77 47
19,719	290,449 90	2,582 57		205,172 00	115	1,896 38	15 00
29,937	457,073 02	5,375 24	21 00	1,071,004 80	9	216 23	.....
97,510	1,753,181 37	11,793 75	9,612 84	1,700,149 78	31	440 39	.....
130,382	3,119,914 50	27,316 34	663 41	4,701,550 96	64	1,671 19	.....
6,971	187,669 13	1,991 46		299,090 00	11	270 35	10 00
34,834	409,854 13	3,020 57	107 00	205,710 25	130	2,859 99	7 00
71,160	1,077,069 22	7,061 73	702 29	1,345,071 31	59	1,308 78	.....
5,465	156,124 96	2,215 30		231,508 42	110	2,872 62	.....
12,499	252,290 22	2,241 67	24 20	235,714 00	32	680 77	.....
190,059	2,956,141 68	21,413 90	570 08	2,953,737 00	235	4,903 65	55 00
2,692	74,229 02	1,604 43	233 16	175,578 00	20	613 55	.....
6,360,611	87,427,047 26	571,714 98	663,820 93	74,785,472 98	20,757	339,072 45	996 42

REPORT OF THE POSTMASTER-GENERAL.

No. 9.—Statement showing the transactions of the Money-Order Office of the

States and Territories.	International—Continued.					
	British.			German.		
	Number of orders paid.	Amount of orders paid.	Amount of orders repaid.	Number of orders paid.	Amount of orders paid.	Amount of orders repaid.
Alabama	62	\$1,515 61	.....	20	\$546 56	\$10 00
Arizona	5	220 07	.....	15	360 23	.....
Arkansas	30	646 53	.....	39	1,051 64	.....
California	637	15,400 29	\$101 50	789	21,080 17	407 00
Colorado	119	2,794 45	35 00	92	2,730 72	25 00
Connecticut	389	6,520 86	10 00	257	6,669 66	56 00
Dakota	17	603 26	32 00	51	1,600 20	.....
Delaware	52	1,054 66	4 00	17	457 70	20 00
District of Columbia	130	1,900 45	21 51	159	3,464 20	.....
Florida	70	1,930 62	28 03	43	1,219 92	.....
Georgia	62	1,463 12	.....	82	1,771 99	.....
Idaho	2	24 03	.....	14	463 74	.....
Illinois	1,286	24,070 49	237 25	2,794	74,506 58	374 64
Indiana	224	4,028 13	.....	506	15,219 88	40 00
Indian Territory	.....	.....	.....	.....	.....	.....
Iowa	281	5,167 12	20 80	1,012	30,358 41	73 00
Kansas	315	7,329 97	36 25	487	13,902 30	48 00
Kentucky	110	1,919 96	.....	225	5,136 27	30 50
Louisiana	308	3,547 90	50 09	329	8,550 46	46 25
Maine	168	8,672 78	9 75	31	826 77	.....
Maryland	213	3,726 29	73 47	489	10,922 46	165 00
Massachusetts	1,610	27,467 66	129 64	268	6,038 42	72 00
Michigan	600	13,083 75	15 20	1,043	28,617 28	141 20
Minnesota	178	3,809 89	2 75	903	27,371 34	72 20
Mississippi	42	1,062 39	.....	48	1,337 57	.....
Missouri	418	9,095 18	12 00	1,237	32,094 50	62 00
Montana	10	340 71	.....	47	1,246 10	.....
Nebraska	202	5,373 25	10 00	379	12,207 98	23 00
Nevada	25	646 24	.....	4	168 28	.....
New Hampshire	98	1,993 45	.....	17	333 23	20 00
New Jersey	978	16,239 44	110 16	924	21,776 41	126 00
New Mexico	6	88 81	.....	17	531 86	.....
New York	6,199	89,824 89	422 82	6,877	149,414 17	901 43
North Carolina	34	602 97	.....	34	638 96	15 00
Ohio	910	16,758 27	218 51	1,536	39,265 39	226 56
Oregon	28	472 85	21 00	53	1,541 09	20 00
Pennsylvania	2,375	38,885 04	247 79	1,867	42,616 42	144 25
Rhode Island	254	4,217 38	16 00	40	1,108 09	.....
South Carolina	34	822 14	.....	50	1,130 31	.....
Tennessee	96	1,648 30	.....	92	2,051 38	36 50
Texas	801	7,891 73	13 00	647	18,732 57	255 00
Utah	166	5,008 16	57 00	52	1,681 18	32 00
Vermont	78	895 62	20 00	11	267 71	5 00
Virginia	233	5,100 96	59 25	58	1,142 81	46 75
Washington	15	449 12	200 00	28	777 48	.....
West Virginia	42	703 90	.....	40	824 90	.....
Wisconsin	253	5,061 35	17 80	1,683	45,476 71	179 00
Wyoming	15	587 05	.....	7	222 57	.....
Total	19,740	345,761 09	2,242 07	25,462	639,542 68	2,630 34

OFFICE OF THE AUDITOR OF THE TREASURY
FOR THE POST-OFFICE DEPARTMENT,
Washington, D. C., August 27, 1879.

United States during the fiscal year ended June 30, 1879—Continued.

International.						Expenses.	Commissions and clerk hire.	Balance due the United States.	Miscellaneous items.
Swiss.			Italian.						
Number of orders paid.	Amount of orders paid.	Amount of orders repaid.	Number of orders paid.	Amount of orders paid.	Amount of orders repaid.				
7	\$156 81					\$458 57	\$5,807 49	\$20,918 46	\$13 28
5	181 49					507 50	1,408 37	14,130 61	
20	510 55		48	\$1,978 51	\$30 00	1,527 46	5,441 95	26,697 49	287 83
11	303 02		2	68 81		3,152 12	13,292 43	28,568 28	68 67
10	261 74					101 05	5,610 43	32,123 61	124 32
						11 90	6,586 48	7,162 06	253 21
8	66 75					791 85	1,759 11	4,836 37	
11	141 59		9	215 00		4 30	753 75	1,175 09	1 76
2	38 92		2	66 67		6,136 45	5,225 00	5,019 46	
3	127 83					158 13	3,035 45	18,112 42	21 01
						25,775 83	8,603 48	24,915 98	71 98
						2 00	832 03	4,265 27	76 22
171	4,856 27	\$251 77	15	502 20		8,101 09	55,013 88	104,206 11	625 88
47	1,570 26		1	38 90		821 07	18,801 63	37,380 20	91 70
							190 89	1,093 91	
49	1,780 72					359 20	26,557 78	50,245 55	210 65
50	1,411 47		7	265 22		263 70	19,028 60	41,870 52	289 20
26	765 76	5 00	29	1,133 76	10 00	2,587 66	8,375 57	15,621 12	80 12
25	698 54		1	5 25		1,700 27	6,662 72	81,534 35	
			8	372 19		74 18	7,372 92	16,675 64	135 26
29	684 94		1			247 00	6,929 24	6,148 18	39 60
23	249 04		21	666 26	80 00	241 66	22,238 51	23,345 07	416 21
66	2,047 41		3	61 76		81 70	23,067 02	52,301 38	224 94
75	2,072 69		1	38 76		6 90	10,415 94	26,086 18	
5	193 83					1,039 07	5,472 06	30,975 05	64 94
29	2,844 78		8	320 25		247 80	25,015 86	51,906 38	208 31
						24 35	1,019 60	17,087 00	64 88
72	2,273 57					800 25	7,874 04	28,710 80	387 78
1	9 65		1	38 61			2,185 79	10,441 94	
8	61 13					17 53	3,502 60	6,174 13	60 20
33	675 97					19 60	5,790 62	7,772 41	133 35
							435 63	8,516 39	
522	10,425 99	143 89	145	2,856 92		3,244 67	90,455 38	95,935 11	466 99
8	173 02					3,414 23	5,477 71	16,294 24	68 90
123	3,336 02	25 00	10	263 21	20 00	151 62	36,877 30	49,776 78	1,095 80
42	1,778 40					93 41	3,680 73	61,776 11	27 62
163	3,536 37	9 75	16	342 20		2,296 37	28,952 10	45,675 42	525 88
7	92 50					7 00	2,043 55	2,172 94	3 19
2	77 97					186 65	4,047 13	14,552 65	109 16
76	2,863 68	19 52	10	454 60		928 10	10,167 82	25,804 58	37 08
44	1,662 02		3	145 50		2,413 29	18,600 37	62,696 43	466 34
5	108 60					411 30	1,283 82	8,350 04	
2	58 26					46 25	3,877 82	6,870 12	148 64
32	1,352 52		5	187 42		340 09	6,840 71	16,145 15	35 31
						10 00	1,334 96	10,099 72	
5	100 06					60	2,092 03	5,617 78	29 65
203	6,279 85	4 70	3	29 02		95 75	19,684 31	52,048 98	185 55
			1	9 67			883 21	4,272 20	11 27
2,010	55,829 99	459 13	349	10,040 69	140 00	63,399 44	550,655 85	1,293,036 49	7,196 66

J. M. McGREW, Auditor.

No. 10.—*Statement showing the receipts and disbursements of the Money-Order Office of the United States during the fiscal year ended June 30, 1879.*

RECEIPTS.

Balance in the hands of postmasters June 30, 1878.....		\$1,170,806 67
Amount received for domestic money-orders issued..	\$38,254,541 02	
Amount received for Canadian international money-orders issued.....	316,283 98	
Amount received for British international money-orders issued.....	894,859 26	
Amount received for German international money-orders issued.....	829,788 36	
Amount received for Swiss international money-orders issued.....	96,171 25	
Amount received for Italian international money-orders issued.....	103,352 11	
Total issued.....		90,494,905 97
Amount received for fees on domestic money-orders issued.....	798,625 65	
Amount received for fees on Canadian international money-orders issued.....	7,217 80	
Amount received for fees on British international money-orders issued.....	27,753 00	
Amount received for fees on German international money-orders issued.....	22,927 00	
Amount received for fees on Swiss international money-orders issued.....	2,758 50	
Amount received for fees on Italian international money-orders issued.....	2,760 25	
Total fees.....		862,042 20
Amount received for premiums, &c.....		721 44
Amount received for deposits.....		65,273,519 14
Amount received for drafts.....		8,295,931 00
Amount transferred from postage fund.....		654,229 71
Amount due postmasters.....		7,783 32
Total.....		166,760 029 45

DISBURSEMENTS.

Amount of domestic money-orders paid.....	\$57,427,047 26	
Amount of Canadian international money-orders paid.....	339,072 45	
Amount of British international money-orders paid.....	345,761 09	
Amount of German international money-orders paid.....	639,542 68	
Amount of Swiss international money-orders paid.....	55,829 99	
Amount of Italian international money-orders paid.....	10,040 69	
Total paid.....		88,817,294 16
Amount of domestic money-orders repaid.....	\$571,714 98	
Amount of Canadian international money-orders repaid.....	966 42	
Amount of British international money-orders repaid.....		
Amount of German international money-orders repaid.....	3,630 34	
Amount of Swiss international money-orders repaid.....	459 13	
Amount of Italian international money-orders repaid.....	140 00	
Total repaid.....		\$579,152 94

Amount transferred to postage fund	\$663,820 93
Amount deposited at first-class offices.....	74,785,472 98
Amount paid for incidental expenses.....	63,399 44
Amount paid for commissions and clerk-hire	550,655 85
Miscellaneous items	7,196 66
Balance in hands of postmasters June 30, 1879....	1,293,036 49

Total..... \$166,760,029 45

J. M. MCGREW, Auditor.

OFFICE OF THE AUDITOR OF THE TREASURY
FOR THE POST-OFFICE DEPARTMENT,
Washington, D. C., October 30, 1879.

No 11.—Statement showing the revenue which accrued on domestic money-order transactions for the fiscal year ended June 30, 1879.

Amount of fees received on orders issued	\$798,625 65
Amount received for premiums, &c.....	721 44

799,347 09

Amount paid for commissions and clerk-hire..... \$512,550 52

Amount paid for expenses, viz: Salary and expenses of—

Special agents.....	\$19,487 47
Lost remittances	4,364 50
Bad debts.....	26,524 54
Incidental expenses	12,459 29

62,836 80

Net revenue..... 223,960 77

799,347 09

J. M. MCGREW, Auditor.

OFFICE OF THE AUDITOR OF THE TREASURY
FOR THE POST-OFFICE DEPARTMENT,
Washington, D. C., October 30, 1879.

No 12.—Statement showing the revenue which accrued on money-order transactions with the Dominion of Canada for the fiscal year ended June 30, 1878.

Amount of fees received on orders issued.....	\$6,054 50
Excess of commissions received.....	406 76

6,461 26

Amount paid for commissions and clerk-hire..... \$5,417 04

Amount paid for incidental expenses..... 996 85

Net revenue..... 48 37

6,461 26

J. M. MCGREW, Auditor.

OFFICE OF THE AUDITOR OF THE TREASURY
FOR THE POST-OFFICE DEPARTMENT,
Washington, D. C., October 30, 1879.

No. 13.—*Statement showing the revenue which accrued on money-order transactions with the United Kingdom of Great Britain and Ireland for the fiscal year ended June 30, 1878.*

Amount received for fees on orders issued.....		\$25, 075 75
Net loss.....		10, 178 88
		<hr/> 35, 254 57
Amount paid for commissions and clerk-hire.....	\$21, 351 22	
Amount paid for incidental expenses.....	200 96	
Excess of commissions paid.....	4, 435 58	
Cost of exchange.....	9, 266 61	
		<hr/> 35, 254 57

J. M. MCGREW, Auditor.

OFFICE OF THE AUDITOR OF THE TREASURY
FOR THE POST-OFFICE DEPARTMENT,
Washington, D. C., October 30, 1879.

No. 14.—*Statement showing the revenue which accrued on money-order transactions with the German Empire for the fiscal year ended June 30, 1878.*

Amount received for fees on orders issued.....		\$21, 610 50
Amount paid for commissions and clerk-hire.....	\$11, 834 78	
Amount paid for incidental expenses.....	58 47	
Excess of commissions paid.....	1, 806 19	
Cost of exchange.....	2, 501 67	
Net revenue.....	5, 410 39	
		<hr/> 21, 610 50

J. M. MCGREW, Auditor.

OFFICE OF THE AUDITOR OF THE TREASURY
FOR THE POST-OFFICE DEPARTMENT,
Washington, D. C., October 30, 1879.

No. 15.—*Statement showing the revenue which accrued on money-order transactions with Switzerland for the fiscal year ended June 30, 1878.*

Amount received for fees on orders issued.....		\$2, 635 25
Amount paid for commissions and clerk-hire.....	\$778 44	
Amount paid for incidental expenses.....	1 99	
Excess of commissions paid.....	371 27	
Cost of exchange.....	549 39	
Net revenue.....	934 16	
		<hr/> 2, 635 25

J. M. MCGREW, Auditor.

OFFICE OF THE AUDITOR OF THE TREASURY
FOR THE POST-OFFICE DEPARTMENT,
Washington, D. C., October 30, 1879.

No. 16.—*Statement showing the revenue which accrued on money-order transactions with the Kingdom of Italy for the fiscal year ended June 30, 1878.*

Amount of fees received on orders issued.....		\$2, 816 50
Net loss.....		948 04
		<hr/> 3, 764 54
Amount paid for commissions and clerk-hire.....	\$598 41	
Amount paid for incidental expenses.....	28 60	
Excess of commissions paid.....	962 58	
Cost of exchange.....	2, 174 95	
		<hr/> 3, 764 54

J. M. MCGREW, Auditor.

OFFICE OF THE AUDITOR OF THE TREASURY
FOR THE POST-OFFICE DEPARTMENT,
Washington, D. C., October 30, 1879.

No. 17.—Recapitulation.

Revenue accrued on domestic transactions, 1879	\$223, 960 77
Revenue accrued on Canadian international transactions, 1878.....	48 37
Revenue accrued on German international transactions, 1878.....	5, 410 39
Revenue accrued on Swiss international transactions, 1878	934 16
	<hr/> 230, 353 69

From which deduct—

Loss on British international transactions, 1878.....	\$10, 178 82	
Loss on Italian international transactions, 1878.....	948 04	
		<hr/> 11, 126 86
Total revenue.....		<hr/> 219, 226 83

J. M. MCGREW, Auditor.

OFFICE OF THE AUDITOR OF THE TREASURY
FOR THE POST-OFFICE DEPARTMENT,
Washington, D. C., October 30, 1879.

No. 18.—Weight of letters and newspapers, &c., sent from the United States to the United Kingdom, in British mails, during the fiscal year ended June 30, 1879.

Lines.	Letters.	Newspapers, &c.
	Grams.	Grams.
Cunard Line.....	18, 764, 625	61, 544, 207
White Star Line.....	9, 577, 893	35, 160, 228
Liverpool and Great Western Steam Company.....	7, 534, 906	37, 504, 788
Inman Line.....	9, 284, 748	46, 795, 498
Hamburg-American Packet Company.....	2, 144, 521	8, 632, 327
Anchor Line.....	1, 076, 871	7, 885, 549
Canadian Line.....	428, 894	3, 065, 521
American Steamship Company.....	420, 294	3, 178, 595
North German Lloyd of Bremen.....	2, 111, 697	8, 522, 266
Total.....	46, 848, 809	212, 527, 078
Compared with last fiscal year.....	{ Increase .. 2, 651, 611	
	{ Decrease ..	665, 687

J. M. MCGREW, Auditor.

OFFICE OF THE AUDITOR OF THE TREASURY
FOR THE POST-OFFICE DEPARTMENT, October 30, 1879.

No. 19.—Weight of letters and newspapers, &c., sent from the United States to Germany in closed mails through England and France, and by direct steamer, during the fiscal year ended June 30, 1879.

Lines.	Letters.	Newspapers, &c.
	Grams.	Grams.
North German Lloyd of Bremen.....	6, 984, 532	31, 718, 287
Hamburg-American Packet Company, direct.....	5, 286, 435	23, 067, 782
Liverpool and Great Western Steam Company, via England.....	4, 177, 539	16, 712, 497
Cunard Line, via England.....	5, 803, 169	18, 199, 111
North German Lloyd of Bremen, via England.....	1, 461, 240	8, 865, 145
Hamburg American Packet Company, via England.....	1, 220, 245	2, 228, 383
Inman Line.....	815, 140	1, 332, 940
White Star Line, via England.....	905, 220	1, 112, 585
Total.....	26, 653, 530	98, 837, 730
Increase, compared with last fiscal year.....	482, 822	1, 074, 689

J. M. MCGREW, Auditor.

OFFICE OF THE AUDITOR OF THE TREASURY
FOR THE POST-OFFICE DEPARTMENT, October 30, 1879.

No. 20.—*Weight of letters and newspapers, &c., sent from the United States to France during the fiscal year ended June 30, 1879.*

Lines.	Letters.	Newspapers &c.
	<i>Grams.</i>	<i>Grams.</i>
Hamburg-American Packet Company.....	1,319,660	7,268,997
White Star Line.....	1,426,702	5,557,362
French Line.....	1,803,882	8,401,143
Inman Line.....	1,302,824	5,762,715
Cunard Line.....	1,043,887	2,305,374
North German Lloyd of Bremen.....	634,971	2,110,553
Liverpool and Great Western Steam Company.....	1,304,980	7,573,188
Total.....	9,111,895	39,899,157
Increase, compared with last fiscal year.....	1,400,000	8,200,504

J. M. MCGREW, Auditor.

OFFICE OF THE AUDITOR OF THE TREASURY
FOR THE POST-OFFICE DEPARTMENT, October 30, 1879.

No. 21.—*Weight of letters and newspapers, &c., sent from the United States to Italy during the fiscal year ended June 30, 1879.*

Lines.	Letters.	Newspapers &c.
	<i>Grams.</i>	<i>Grams.</i>
Cunard Line.....	739,675	2,682,046
Hamburg-American Packet Company.....	142,379	689,631
Liverpool and Great Western Steam Company.....	405,142	2,308,019
Inman Line.....	507,081	3,851,944
White Star Line.....	501,876	3,881,005
North German Lloyd of Bremen.....	175,788	1,045,185
Total.....	2,702,372	15,536,830
Increase, compared with last fiscal year.....	169,405	2,622,716

J. M. MCGREW, Auditor.

OFFICE OF THE AUDITOR OF THE TREASURY
FOR THE POST-OFFICE DEPARTMENT, October 30, 1879.

No. 22.—*Weight of letters and newspapers, &c., sent from the United States to Belgium during the fiscal year ended June 30, 1879.*

Lines.	Letters.	Newspapers &c.
	<i>Grams.</i>	<i>Grams.</i>
Cunard Line.....	271,825	1,654,322
Hamburg-American Packet Company.....	69,021	155,639
Liverpool and Great Western Steam Company.....	146,889	771,682
White Star Line.....	213,905	698,387
North German Lloyd of Bremen.....	70,304	208,386
Red Star Line.....	1,899	—
Inman Line.....	190,774	572,681
Total.....	963,828	3,955,397
Increase, compared with last fiscal year.....	79,694	528,877

J. M. MCGREW, Auditor.

OFFICE OF THE AUDITOR OF THE TREASURY
FOR THE POST-OFFICE DEPARTMENT, October 30, 1879.

No. 23.—*Weight of letters and newspapers, &c., sent from the United States to Denmark during the fiscal year ended June 30, 1879.*

Lines.	Letters.	Newspapers, &c.
	<i>Grams.</i>	<i>Grams.</i>
Hamburg-American Packet Company	757, 230	2, 103, 934
North German Lloyd of Bremen	364, 906	1, 021, 537
Total	1, 122, 136	3, 125, 471
Increase, compared with last fiscal year	57, 860	85, 852

J. M. MCGREW, Auditor.

OFFICE OF THE AUDITOR OF THE TREASURY
FOR THE POST-OFFICE DEPARTMENT, October 30, 1879.

No. 24.—*Weight of letters and newspapers, &c., sent from the United States to the Netherlands during the fiscal year ended June 30, 1879.*

Lines.	Letters.	Newspapers, &c.
	<i>Grams.</i>	<i>Grams.</i>
White Star Line	278, 260	1, 081, 874
Cunard Line	397, 698	1, 229, 247
Inman Line	279, 238	1, 190, 123
Liverpool and Great Western Steam Company	173, 290	637, 880
Hamburg-American Packet Company	97, 379	195, 763
North German Lloyd of Bremen	96, 634	260, 596
Netherlands American Steam Navigation Company	4, 030	7, 446
Total	1, 326, 388	4, 601, 933
Increase, compared with last fiscal year	206, 553	814, 938

J. M. MCGREW, Auditor.

OFFICE OF THE AUDITOR OF THE TREASURY
FOR THE POST-OFFICE DEPARTMENT, October 30, 1879.

No. 25.—*Weight of letters and newspapers, &c., sent from the United States to Switzerland during the fiscal year ended June 30, 1879.*

Lines.	Letters.	Newspapers, &c.
	<i>Grams.</i>	<i>Grams.</i>
Cunard Line	542, 287	2, 180, 745
Liverpool and Great Western Steam Company	349, 576	1, 802, 304
White Star Line	430, 792	2, 318, 820
Hamburg-American Packet Company	141, 253	548, 449
Inman Line	427, 408	2, 320, 369
North German Lloyd of Bremen	140, 118	571, 919
Total	2, 031, 414	9, 742, 606
Increase, compared with last fiscal year	127, 378	1, 094, 727

J. M. MCGREW, Auditor.

OFFICE OF THE AUDITOR OF THE TREASURY
FOR THE POST-OFFICE DEPARTMENT, October 30, 1879.

No. 26.—*Weight of letters and newspapers, &c., sent from the United States to Spain during the fiscal year ended June 30, 1879.*

Lines.	Letters.	Newspapers, &c.
	<i>Grams.</i>	<i>Grams.</i>
Cunard Line.....	200, 471	1, 158, 832
White Star Line.....	100, 513	1, 133, 673
Hamburg-American Packet Company.....	42, 899	146, 908
Inman Line.....	174, 887	1, 208, 913
Liverpool and Great Western Steam Company.....	123, 606	672, 633
North German Lloyd of Bremen.....	48, 580	297, 270
Total.....	750, 887	4, 678, 317
Increase, compared with last fiscal year.....	156, 512	1, 325, 991

J. M. MCGREW, Auditor.

OFFICE OF THE AUDITOR OF THE TREASURY
FOR THE POST-OFFICE DEPARTMENT, October 30, 1879.

No. 27.—*Weight of letters and newspapers, &c., sent from the United States to Sweden during the fiscal year ended June 30, 1879.*

Lines.	Letters.	Newspapers, &c.
	<i>Grams.</i>	<i>Grams.</i>
Hamburg-American Packet Company.....	1, 585, 590	3, 967, 023
North German Lloyd of Bremen.....	689, 810	2, 578, 609
Inman Line.....	1, 935	6, 340
Total.....	2, 277, 275	6, 571, 962
Increase, compared with last fiscal year.....	94, 945	1, 307, 863

J. M. MCGREW, Auditor.

OFFICE OF THE AUDITOR OF THE TREASURY
FOR THE POST-OFFICE DEPARTMENT, October 30, 1879.

No. 28.—*Weight of letters and newspapers, &c., sent from the United States to countries and colonies (other than European) of the Postal Union during the fiscal year ended June 30, 1879.*

Countries and colonies.	Letters.	Newspapers, &c.
	<i>Grams.</i>	<i>Grams.</i>
Cuba.....	3, 918, 740	16, 039, 250
Japan.....	845, 908	7, 485, 698
Hong-Kong.....	465, 015	2, 215, 808
Jamaica.....	275, 645	1, 551, 738
Bermuda.....	321, 219	2, 439, 463
St. Thomas.....	641, 144	2, 716, 542
Brazil.....	509, 309	2, 865, 532
New Caledonia.....	6, 201	38, 055
Calcutta.....	4, 418	37, 364
Bombay.....	5, 348	81, 703
Ceylon.....	1, 199	6, 873
Manilla.....	19, 470	113, 990
Singapore.....	3, 488	30, 940
Marquesas Island.....	1, 531	7, 107
Tahiti.....	21, 295	331, 058
Peru (entered Postal Union October 1, 1878).....	252, 057	1, 605, 332
Java.....	3, 281	8, 916
Penang.....	688	1, 799
Madras.....	661	11, 414
British Burmah.....	804	20, 972
Martinique and Guadeloupe.....	30, 129	92, 072
Mexico and San Salvador.....	142, 400	2, 123, 937
Newfoundland.....	8, 900	75, 220
Shanghai.....	77, 378	821, 309
Total.....	7, 616, 089	40, 928, 071
Increase, compared with last fiscal year.....	1, 482, 194	15, 556, 239

J. M. MCGREW, Auditor.

OFFICE OF THE AUDITOR OF THE TREASURY
FOR THE POST-OFFICE DEPARTMENT, October 30 1879.

WEIGHT OF MAILS TO FOREIGN COUNTRIES.

409

No. 29.—*Weight of letters and newspapers, &c., sent from the United States to Norway during the fiscal year ended June 30, 1879.*

Lines.	Letters.	Newspapers, &c.
	Grams.	Grams.
Hamburg-American Packet Company	1, 375, 400	2, 668, 714
North German Lloyd of Bremen	672, 690	1, 358, 028
Total	2, 048, 090	4, 026, 742
Increase, compared with last fiscal year	213, 696	271, 261

J. M. MCGREW, Auditor.

OFFICE OF THE AUDITOR OF THE TREASURY
FOR THE POST-OFFICE DEPARTMENT, October 30, 1879.

No. 30.—*Number of letters exchanged between the United States and non-Postal Union countries during the fiscal year ended June 30, 1879.*

Countries.	Number of letters.	
	Received.	Sent.
Nassau, Hayti, &c.	61, 747	90, 103
Panama, Central America, &c.	152, 297	98, 439
New Zealand, Australia, &c.	18, 106	148, 068
Mexico	39, 428	43, 551
Venezuela	7, 689	11, 844
Guatemala	7, 526	10, 746
Ecuador	1, 830	5, 124
Total	288, 273	403, 500

J. M. MCGREW, Auditor.

OFFICE OF THE AUDITOR OF THE TREASURY
FOR THE POST-OFFICE DEPARTMENT, October 30, 1879.

No. 31.—*Weight of letters and newspapers, &c., sent from the United States to European countries during the fiscal year ended June 30, 1879.*

Countries.	Letters.	Newspapers, &c.
	Grams.	Grams.
United Kingdom of Great Britain and Ireland	46, 848, 809	212, 327, 073
Germany	26, 053, 520	98, 837, 730
France	9, 111, 895	39, 899, 167
Italy	2, 702, 372	15, 526, 920
Belgium	966, 952	3, 875, 226
Denmark	1, 152, 135	3, 125, 491
Netherlands	1, 826, 338	4, 601, 933
Switzerland	2, 031, 414	9, 742, 606
Spain	750, 887	4, 678, 317
Sweden	2, 277, 275	6, 571, 952
Norway	2, 048, 090	4, 026, 742
Total	95, 364, 187	403, 213, 157
Increase, compared with last fiscal year	5, 099, 806	16, 742, 571

J. M. MCGREW, Auditor.

OFFICE OF THE AUDITOR OF THE TREASURY
FOR THE POST-OFFICE DEPARTMENT, October 30, 1879.

Statement showing the receipts of money by postmasters during the fiscal years 1877 and 1878, and the amount of losses by defalcation, etc., during the same period.

OFFICE OF THE AUDITOR OF THE TREASURY
FOR THE POST-OFFICE DEPARTMENT,
November 17, 1879.

Statement showing the receipts of the Post-Office Department for two years ending June 30, 1878, and the amount of bad debts and suits during the same period.

The number of post-offices during the two years was from thirty-nine thousand to forty-one thousand.

Receipts from ordinary revenues.....	\$56,809,102 21
Receipts from sale of money-orders.....	158,154,625 41

Total amount received by postmasters during the two years...	914,963,727 62
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Postal bad debts	2,088 36
Postal compromise debts	379 40
Money-order bad debts	573 30

Total compromise and bad debts.....	3,041 06
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Postal accounts remaining in suit.....	75,557 67
Money-order accounts remaining in suit.....	20,728 63

Total in suit	96,286 30
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More than one-half of the amount in suit will be finally collected, but, regarding the whole amount as uncollectible, the per cent. of loss is .0046+, or less than one-twentieth of one per cent.

J. M. MCGREW, Auditor.

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